

5 Substituted N-aryl heterocycles, process for their preparation and their use as medicaments

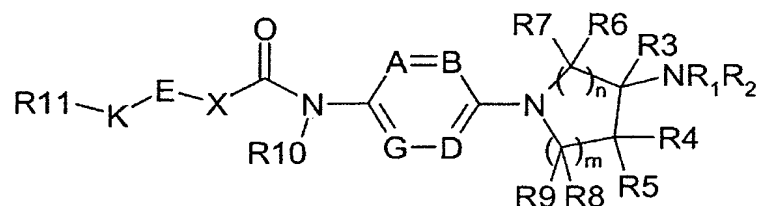
Description

10 The invention relates to substituted N-aryl heterocycles and to the physiologically tolerated salts and physiologically functional derivatives thereof.

Compounds having a pharmacological effect and similar in their overall
15 structure to the N-aryl heterocycles described herein have already been described in the prior art. Thus, for example, WO 00/35454 describes ureido-substituted phenylpiperidines and -pyrrolidines as agents for the treatment of inflammatory and autoimmune diseases. Acylamido-substituted phenylpyrrolidines are proposed in WO 02/042271 for the
20 treatment of diabetes, obesity and disorders of lipid metabolism.

The invention was based on the object of providing compounds which bring about a weight reduction in mammals and are suitable for preventing and
25 treating obesity and diabetes.

The invention therefore relates to compounds of the formula I



30 wherein

R1, R2 are each independently H, (C₁-C₈)-alkyl, -(CR₇R₈)₀-R₁₂,
(C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, aryloxy-(C₁-C₄)-alkyl, (C₃-C₈)-
alkenyl, (C₃-C₈)-alkynyl, CO-(C₁-C₈)-alkyl, -CO-(CH₂)₀-R₁₂,
35 CO-aryloxy-(C₁-C₄)-alkyl, CO-(C₂-C₈)-alkenyl,

CO-(C₂-C₈)-alkynyl, COCH=CH(R₁₃), COCC(R₁₄), CO-(C₁-C₄)-alkyl-S(O)_p-(C₁-C₄)-alkyl, CO(C(R₁₅)(R₁₆))_qN(R₁₇)(R₁₈), CO(C(R₁₉)(R₂₀))_rCON(R₂₁)(R₂₂) or CO(C(R₂₃)(R₂₄))_sO(R₂₅);

or

5 R₁ and R₂, together with the nitrogen atom to which they are attached, form a 4-, 5-, 6-, 7-, 8-, 9- or 10-membered mono-, bi- or spirocyclic ring which, apart from said nitrogen atom of attachment, optionally contains 1, 2, 3 or 4 additional
10 heteroatoms selected from the group of oxygen, nitrogen and sulfur, and is optionally substituted by F, Cl, Br, CF₃, NO₂, CN, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, hydroxy-(C₁-C₄)-alkyl, (C₀-C₈)-alkylene-aryl, oxo, CO(R₂₆), CON(R₂₇)(R₂₈), hydroxy, COO(R₂₉), N(R₃₀)CO(C₁-C₆)-alkyl, N(R₃₁)(R₃₂) or SO₂CH₃;

15

wherein

o is 0, 1, 2, 3, 4, 5 or 6;

20

p is 0, 1 or 2

q, r, s are each independently 0, 1, 2, 3 or 4;

25

R₁₃, R₁₄ are each independently a 5-, 6-, 7-, 8-, 9- or 10-membered aromatic ring system optionally containing 1 or 2 heteroatoms selected from the group of nitrogen, oxygen and sulfur, and is optionally substituted by F, Cl, Br, CF₃, NO₂, CN, (C₁-C₆)-alkyl or O-(C₁-C₈)-alkyl;

30

R₁₅, R₁₆, R₁₇, R₁₉, R₂₀, R₂₁, R₂₂, R₂₃, R₂₄, R₂₅, R₂₆, R₂₇, R₂₈, R₂₉, R₃₀, R₃₁, R₃₂ are each independently H or (C₁-C₆)-alkyl;

35

R₁₈ is H, (C₁-C₆)-alkyl, CO(C₁-C₆)-alkyl or CO(R₃₃); or

substituent pairs R₁₇ and R₁₈, R₂₁ and R₂₂, R₂₇ and R₂₈, and R₃₁ and R₃₂, independently of one another and taken together with the nitrogen atom to which they are

attached, optionally form a 5- or 6-membered ring which, apart from said nitrogen atom of attachment, optionally contains one additional heteroatom component selected from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur;

5

R33 is a 5-, 6-, 7-, 8-, 9- or 10-membered aromatic ring system which optionally contains 1 or 2 heteroatoms selected from the group of nitrogen, oxygen and sulfur, and is optionally substituted by F, Cl, Br, CF₃, NO₂, CN, (C₁-C₆)-alkyl or O-(C₁-C₈)-alkyl;

10

R12 is OH, O-(C₁-C₆)-alkyl, O(C₀-C₈)-alkylene-aryl, CN, S-(C₁-C₆)-alkyl, COO(R80), CON(R81)(R93), N(R82)(R83) or a 3-, 4-, 5-, 6-, 7-, 8-, 9-, 10-, 11-, or 12-membered mono-, bi- or spirocyclic ring which optionally contains one or more heteroatoms selected from the group of N, O and S, and is optionally substituted with F, Cl, Br, I, OH, CF₃, NO₂, CN, OCF₃, oxo, O-(C₁-C₆)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, S-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl, (C₃-C₈)-cycloalkyl, O-(C₃-C₈)-cycloalkyl, (C₃-C₈)-cycloalkenyl, O-(C₃-C₈)-cycloalkenyl, (C₂-C₆)-alkynyl, O-(C₀-C₈)-alkylene-aryl, N(R34)(R35), COCH=CH(R36), (C(R37)(R38))_t(R39), CO(C(R37)(R38))_t(R39), CO(C₁-C₆)-alkyl, COCOO(C₁-C₆)-alkyl, COO(R40), S(O)_u(R41) or COOH;

15

20

25

t is 0, 1, 2, 3, 4, 5 or 6;

u is 0, 1 or 2;

30

R34, R35, R37, R38 are each independently H or (C₁-C₈)-alkyl; or

35

R34 and R35, taken together with the nitrogen atom to which they are attached, optionally form a 5- or 6-membered ring which, apart from said nitrogen atom of attachment, optionally contains one additional heteroatom component selected from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur, and is optionally

substituted by 1 or 2 oxo groups;

5 R36, R39 are each independently (C₃-C₈)-cycloalkyl or a 5-, 6-, 7-, 8-, 9- or 10- membered aromatic ring system wherein said aromatic ring system optionally contains one or two additional heteroatoms selected from the group of nitrogen, oxygen and sulfur, and is optionally substituted by F, Cl, Br, CF₃, NO₂, CN, (C₁-C₆)-alkyl or O-(C₁-C₈)-alkyl;

10 R40 is H, (C₁-C₈)-alkyl, (C₂-C₆)-alkenyl or (C₀-C₈)-alkylene-aryl;

15 R41 is (C₁-C₆)-alkyl or a 5-, 6-, 7-, 8-, 9-, or 10-membered aromatic ring system optionally containing one or two heteroatoms from the group of nitrogen, oxygen and sulfur, and optionally substituted by F, Cl, Br, CF₃, NO₂, CN, (C₁-C₆)-alkyl or O-(C₁-C₈)-alkyl;

20 R78, R79 are each independently H, (C₁-C₈)-alkyl, hydroxy-(C₁-C₄)-alkyl, OH or (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl;

R80, R81, R93 are each independently (C₁-C₈)-alkyl, (C₂-C₆)-alkenyl or (C₀-C₈)-alkylene-aryl;

25 R82, R83 are each independently H or (C₁-C₆)-alkyl; or

30 R82 and R83, taken together with the nitrogen atom to which they are attached, optionally form a 5- or 6-membered ring which, apart from said nitrogen atom of attachment, optionally contains one additional heteroatom component selected from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur, and is optionally substituted by 1 or 2 oxo groups;

R3 is H or (C₁-C₆)-alkyl;

35 R4, R5 are each independently H, (C₁-C₆)-alkyl, OH, O-(C₁-C₆)-alkyl, O-CO(C₁-C₆)-alkyl or S-(C₁-C₆)-alkyl;

R6, R7, R8, R9 are each independently H or (C₁-C₈)-alkyl; or

substituent pairs R6 and R7, and R8 and R9, optionally form, independently of one another, an oxo group;

5 n, m are each independently 0, 1 or 2;

A, B, D, G are each independently N or C(R42); or

10 said radicals A and B, or said radicals D and G are each C(R42) and, taken together, optionally form a 5- or 6 membered carbocyclic or heterocyclic radical resulting in an overall bicyclic ring system;

wherein

15

R42 is H, F, Cl, Br, I, OH, CF₃, NO₂, CN, OCF₃, O-(C₁-C₆)-alkyl, O-(C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, S-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl, (C₃-C₈)-cycloalkyl, O-(C₃-C₈)-cycloalkyl, (C₃-C₈)-cycloalkenyl, O-(C₃-C₈)-cycloalkenyl, (C₂-C₆)-alkynyl, (C₀-C₈)-alkylene-aryl, O-(C₀-C₈)-alkylene-aryl, S-aryl, N(R43)(R44), SO₂-CH₃, COOH, COO-(C₁-C₆)-alkyl, CON(R45)(R46), N(R47)CO(R48), N(R49)SO₂(R50), CO(R51) or -(CR₈₄R₈₅)_x-O(R86);

25

wherein

30

R43, R44, R45, R46, R47, R49 are each independently H or (C₁-C₈)-alkyl; or

35

substituent pairs R43 and R44, and R45 and R46, independently of one another and taken together with the nitrogen atom to which they are attached, optionally form a 5- or 6-membered ring which, apart from said nitrogen atom of attachment, optionally contains an additional heteroatom component selected from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur;

R48, R50, R51 are each independently H, (C₁-C₈)-alkyl or aryl;

5 R84, R85 are each independently H or (C₁-C₈)-alkyl;

R86 is H, (C₁-C₆)-alkyl or aryl;

10 x is 1, 2, 3, 4, 5 or 6;

R10 is H, (C₁-C₈)-alkyl, (C₃-C₆)-alkenyl or (C₃-C₆)-alkynyl;

15 X is N(R52), O, a bond, C=C, C(R53)(R54), C(R55)(R56)O, CO, C≡C, or a group of the formula -(CR₈₇R₈₈)_Y- wherein one or more -(CR₈₇R₈₈)- units contained in said group of formula -(CR₈₇R₈₈)_Y- is optionally replaced by Y;

wherein

20 Y is O, S or N(R89) wherein R89 is H or (C₁-C₈)-alkyl;

R52, R53, R54, R55, R56 are each independently H or (C₁-C₈)-alkyl;

25 R87, R88 are each independently H or (C₁-C₄)-alkyl, and may be defined the same or differently in each of said -(CR₈₇R₈₈)- units contained in said group of formula -(CR₈₇R₈₈)_Y-;

30 y is 2, 3, 4, 5 or 6;

35 E is a 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13- or 14-membered bivalent carbo- or heterocyclic ring structure with 0, 1, 2, 3 or 4 heteroatoms selected from the group of N, O and S, and optionally substituted with H, F, Cl, Br, I, OH, CF₃, NO₂, CN, OCF₃, oxo, O-(C₁-C₆)-alkyl, O-(C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, S-

(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl, (C₃-C₈)-cycloalkyl, O-(C₃-C₈)-cycloalkyl, (C₃-C₈)-cycloalkenyl, O-(C₃-C₈)-cycloalkenyl, (C₂-C₆)-alkynyl, (C₀-C₈)-alkylene-aryl, O-(C₀-C₈)-alkylene-aryl, S-aryl, N(R57)(R58), SO₂-CH₃, COOH, COO-(C₁-C₆)-alkyl, CON(R59)(R60), N(R61)CO(R62), N(R63)SO₂(R64) or CO(R65), and wherein said bivalent carbo- or heterocyclic ring structure is mono- or bicyclic;

wherein

R57, R58, R59, R60, R61, R63 are each independently H or (C₁-C₈)-alkyl; or

substituent pairs R57 and R58, and R59 and R60, independently of one another and taken together with the nitrogen atom to which they are attached, optionally form a 5- or 6-membered ring which, apart from said nitrogen atom of attachment, optionally contains one further heteroatom component selected from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur;

R62, R64, R65 are each independently H, (C₁-C₈)-alkyl or aryl;

K is a bond, O, OCH₂, CH₂O, S, SO, SO₂, N(R66), N(R67)CO, CON(R68), (C(R69)(R70))_v, CO, C≡C, C=C or a group of the formula -(CR₉₀R₉₁)_z- in which one or more of the -(CR₉₀R₉₁)- units contained in said group of the formula -(CR₉₀R₉₁)_z- is optionally replaced by Z;

wherein

v is 1, 2, 3 or 4

R66, R67, R68, R69, R70 are each independently H or (C₁-C₈)-alkyl;

Z is O, S, N(R92), CO, SO or SO₂;

5 R90, R91 are each independently H, (C₁-C₈)-alkyl, hydroxy-(C₁-C₄)-alkyl, hydroxy or (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, and wherein R90 and R91 may be defined the same or differently in each of said -(CR₉₀R₉₁)- units contained in said group of formula
 -(CR₉₀R₉₁)_z;

10 z is 2, 3, 4, 5 or 6;

R92 is H or (C₁-C₈)-alkyl;

15 R11 is H, (C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, (C₃-C₈)-alkenyl, (C₃-C₈)-alkynyl or a 3-, 4-, 5-, 6-, 7-, 8-, 9- or 10-membered mono-, bi- or spirocyclic ring, optionally containing 1, 2, 3 or 4 heteroatoms selected from the group of oxygen, nitrogen and sulfur, and optionally substituted by F, Cl, Br, CF₃, NO₂, CN, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, (C₀-C₈)-alkylene-aryl, oxo, CO(R71), CON(R72)(R73),
 20 hydroxy, hydroxy-(C₁-C₄)-alkyl, COO(R74), N(R75)CO(C₁-C₆)-alkyl, N(R76)(R77), SO₂CH₃ or SCF₃;

wherein

25 R71, R72, R73, R74, R75, R76, R77 are each independently H or (C₁-C₈)-alkyl; or

30 substituent pairs R72 and R73, and R76 and R77, independently of one another and taken together with the nitrogen atom to which they are attached, optionally form a 5- or 6- membered ring which, apart from the nitrogen atom, optionally contain one additional heteroatom component selected from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur; or

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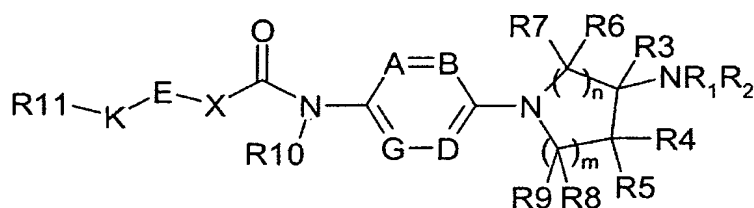
E, K and R11 taken together form a tricyclic system where each of the rings in said tricyclic system are, independently of one another, saturated, partially saturated or unsaturated, and wherein each

ring is comprised of 3-8 ring atoms;

and the N-oxides and pharmaceutically acceptable salts thereof.

- 5 In a further embodiment, the invention therefore relates to compounds of the formula I in which the meanings are:

10



I

wherein

- 15 R1, R2 are each independently H, (C₁-C₈)-alkyl, -(CR₇CR₉)_o-R₁₂, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, aryloxy-(C₁-C₄)-alkyl, (C₃-C₈)-alkenyl, (C₃-C₈)-alkynyl, CO-(C₁-C₈)-alkyl, -CO-(CH₂)_o-R₁₂, CO-aryloxy-(C₁-C₄)-alkyl, CO-(C₂-C₈)-alkenyl, CO-(C₂-C₈)-alkynyl, COCH=CH(R₁₃), COCC(R₁₄), CO-(C₁-C₄)-alkyl-S(O)_p-(C₁-C₄)-alkyl, CO(C(R₁₅)(R₁₆))_qN(R₁₇)(R₁₈),
 20 CO(C(R₁₉)(R₂₀))_rCON(R₂₁)(R₂₂) or CO(C(R₂₃)(R₂₄))_sO(R₂₅);
 or

- 25 R1 and R2, together with the nitrogen atom to which they are attached, form a 4-, 5-, 6-, 7-, 8-, 9- or 10-membered mono-, bi- or spirocyclic ring which, apart from said nitrogen atom of attachment, optionally contains 1, 2, 3 or 4 additional heteroatoms selected from the group of oxygen, nitrogen and sulfur, and is optionally substituted by F, Cl, Br, CF₃, NO₂, CN, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, (C₀-C₈)-alkylene-aryl, oxo, CO(R₂₆), CON(R₂₇)(R₂₈), hydroxy,
 30 COO(R₂₉), N(R₃₀)CO(C₁-C₆)-alkyl, N(R₃₁)(R₃₂) or SO₂CH₃;

wherein

o is 0, 1, 2, 3, 4, 5 or 6;

p is 0, 1 or 2

q, r, s are each independently 0, 1, 2, 3 or 4;

5

R13, R14 are each independently a 5-, 6-, 7-, 8-, 9- or 10-membered aromatic ring system optionally containing 1 or 2 heteroatoms selected from the group of nitrogen, oxygen and sulfur, and is optionally substituted by F, Cl, Br, CF₃, NO₂, CN, (C₁-C₆)-alkyl or O-(C₁-C₈)-alkyl;

10

R15, R16, R17, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32 are each independently H or (C₁-C₆)-alkyl;

15

R18 is H, (C₁-C₆)-alkyl, CO(C₁-C₆)-alkyl or CO(R33); or

substituent pairs R17 and R18, R21 and R22, R27 and R28, and R31 and R32, independently of one another and taken together with the nitrogen atom to which they are attached, optionally form a 5- or 6-membered ring which, apart from said nitrogen atom of attachment, optionally contains one additional heteroatom component selected from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur;

20

25

R33 is a 5-, 6-, 7-, 8-, 9- or 10-membered aromatic ring system which optionally contains 1 or 2 heteroatoms selected from the group of nitrogen, oxygen and sulfur, and is optionally substituted by F, Cl, Br, CF₃, NO₂, CN, (C₁-C₆)-alkyl or O-(C₁-C₈)-alkyl;

30

35

R12 is OH or a 3-, 4-, 5-, 6-, 7-, 8-, 9-, 10-, 11-, or 12-membered mono-, bi- or spirocyclic ring which optionally contains one or more heteroatoms selected from the group of N, O and S, and is optionally substituted with F, Cl, Br, I, OH, CF₃, NO₂, CN, OCF₃, oxo, O-(C₁-C₆)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, S-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl, (C₃-C₈)-cycloalkyl, O-(C₃-C₈)-

cycloalkyl, (C₃-C₈)-cycloalkenyl, O-(C₃-C₈)-cycloalkenyl,
 (C₂-C₆)-alkynyl, O-(C₀-C₈)-alkylene-aryl, N(R₃₄)(R₃₅),
 COCH=CH(R₃₆), (C(R₃₇)(R₃₈))_t(R₃₉),
 CO(C(R₃₇)(R₃₈))_t(R₃₉), CO(C₁-C₆)-alkyl,
 5 COCOO(C₁-C₆)-alkyl, COO(R₄₀), S(O)_u(R₄₁) or COOH;

t is 0, 1, 2, 3, 4, 5 or 6;

u is 0, 1 or 2;

10

R₃₄, R₃₅, R₃₇, R₃₈ are each independently H or (C₁-C₈)-alkyl;
 or

15

R₃₄ and R₃₅, taken together with the nitrogen atom to which
 they are attached, optionally form a 5- or 6-membered ring
 which, apart from said nitrogen atom of attachment, optionally
 contains one additional heteroatom component selected from the
 group of N-(C₁-C₆)-alkyl, oxygen and sulfur, and is optionally
 substituted by 1 or 2 oxo groups;

20

R₃₆, R₃₉ are each independently (C₃-C₈)-cycloalkyl or a 5-, 6-,
 7-, 8-, 9- or 10- membered aromatic ring system wherein said
 aromatic ring system optionally contains one or two additional
 heteroatoms selected from the group of nitrogen, oxygen and
 25 sulfur, and is optionally substituted by F, Cl, Br, CF₃, NO₂, CN,
 (C₁-C₆)-alkyl or O-(C₁-C₈)-alkyl;

R₄₀ is H, (C₁-C₈)-alkyl, (C₂-C₆)-alkenyl or (C₀-C₈)-alkylene-aryl;

30

R₄₁ is (C₁-C₆)-alkyl or a 5-, 6-, 7-, 8-, 9-, or 10-membered
 aromatic ring system optionally containing one or two
 heteroatoms from the group of nitrogen, oxygen and sulfur, and
 optionally substituted by F, Cl, Br, CF₃, NO₂, CN, (C₁-C₆)-alkyl
 or O-(C₁-C₈)-alkyl;

35

R₃ is H or (C₁-C₆)-alkyl;

R₄, R₅ are each independently H, (C₁-C₆)-alkyl, OH, O-(C₁-C₆)-alkyl, O-

CO(C₁-C₆)-alkyl or S-(C₁-C₆)-alkyl;

R₆, R₇, R₈, R₉ are each independently H or (C₁-C₈)-alkyl; or

5 substituent pairs R₆ and R₇, and R₈ and R₉, optionally form, independently of one another, an oxo group;

n, m are each independently 0, 1 or 2;

10 A, B, D, G are each independently N or C(R₄₂);

wherein

15 R₄₂ is H, F, Cl, Br, I, OH, CF₃, NO₂, CN, OCF₃, O-(C₁-C₆)-alkyl, O-(C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, S-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl, (C₃-C₈)-cycloalkyl, O-(C₃-C₈)-cycloalkyl, (C₃-C₈)-cycloalkenyl, O-(C₃-C₈)-cycloalkenyl, (C₂-C₆)-alkynyl, (C₀-C₈)-alkylene-aryl, O-(C₀-C₈)-alkylene-aryl, S-aryl, N(R₄₃)(R₄₄), SO₂-CH₃,
20 COOH, COO-(C₁-C₆)-alkyl, CON(R₄₅)(R₄₆), N(R₄₇)CO(R₄₈), N(R₄₉)SO₂(R₅₀) or CO(R₅₁);

wherein

25 R₄₃, R₄₄, R₄₅, R₄₆, R₄₇, R₄₉ are each independently H or (C₁-C₈)-alkyl; or

30 substituent pairs R₄₃ and R₄₄, and R₄₅ and R₄₆, independently of one another and taken together with the nitrogen atom to which they are attached, optionally form a 5- or 6-membered ring which, apart from said nitrogen atom of attachment, optionally contains an additional heteroatom component selected from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur;
35

R₄₈, R₅₀, R₅₁ are each independently H, (C₁-C₈)-alkyl or aryl;

R10 is H, (C₁-C₈)-alkyl, (C₃-C₆)-alkenyl or (C₃-C₆)-alkynyl;

X is N(R52), O, a bond, C=C, C(R53)(R54) or C(R55)(R56)O;

5

wherein

R52, R53, R54, R55, R56 are each independently H or (C₁-C₈)-alkyl;

10

E is a 3, 4, 5, 6, 7 or 8-membered bivalent carbo- or heterocyclic ring structure with 0, 1, 2, 3 or 4 heteroatoms selected from the group of N, O and S, and optionally substituted with H, F, Cl, Br, I, OH, CF₃, NO₂, CN, OCF₃, O-(C₁-C₆)-alkyl, O-(C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, S-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl, (C₃-C₈)-cycloalkyl, O-(C₃-C₈)-cycloalkyl, (C₃-C₈)-cycloalkenyl, O-(C₃-C₈)-cycloalkenyl, (C₂-C₆)-alkynyl, (C₀-C₈)-alkylene-aryl, O-(C₀-C₈)-alkylene-aryl, S-aryl, N(R57)(R58), SO₂-CH₃, COOH, COO-(C₁-C₆)-alkyl, CON(R59)(R60), N(R61)CO(R62), N(R63)SO₂(R64) or CO(R65), and wherein said bivalent carbo- or heterocyclic ring structure is mono- or bicyclic;

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wherein

25

R57, R58, R59, R60, R61, R63 are each independently H or (C₁-C₈)-alkyl; or

30

substituent pairs R57 and R58, and R59 and R60, independently of one another and taken together with the nitrogen atom to which they are attached, optionally form a 5- or 6-membered ring which, apart from said nitrogen atom of attachment, optionally contains one further heteroatom component selected from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur;

35

R62, R64, R65 are each independently H, (C₁-C₈)-alkyl or aryl;

K is a bond, O, OCH₂, CH₂O, S, SO, SO₂, N(R66), N(R67)CO, CON(R68), (C(R69)(R70))_v, CO or C≡C;

wherein

5

v is 1, 2, 3 or 4

R66, R67, R68, R69, R70 are each independently H or (C₁-C₈)-alkyl;

10

R11 is H, (C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, (C₃-C₈)-alkenyl, (C₃-C₈)-alkynyl or a 3-, 4-, 5-, 6-, 7-, 8-, 9- or 10-membered mono-, bi- or spirocyclic ring, optionally containing 1, 2, 3 or 4 heteroatoms selected from the group of oxygen, nitrogen and sulfur, and optionally substituted by F, Cl, Br, CF₃, NO₂, CN, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, (C₀-C₈)-alkylene-aryl, oxo, CO(R71), CON(R72)(R73), hydroxy, COO(R74), N(R75)CO(C₁-C₆)-alkyl, N(R76)(R77) or SO₂CH₃;

15

20

wherein

R71, R72, R73, R74, R75, R76, R77 are each independently H or (C₁-C₈)-alkyl; or

25

substituent pairs R72 and R73, and R76 and R77, independently of one another and taken together with the nitrogen atom to which they are attached, optionally form a 5- or 6- membered ring which, apart from the nitrogen atom, optionally contain one additional heteroatom component selected from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur; or

30

E, K and R11 taken together form a tricyclic system where each of the rings in said tricyclic system are, independently of one another, saturated, partially saturated or unsaturated, and wherein each ring is comprised of 3-8 ring atoms;

35

and the N-oxides and pharmaceutically acceptable salts thereof.

The invention relates to compounds of the formula I in the form of their racemates, enantiomer-enriched mixtures and pure enantiomers, and to
5 their diastereomers and mixtures thereof.

The alkyl, alkenyl and alkynyl radicals in the substituents R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33,
10 R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R77, R78, R79, R80, R81, R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, R92 and R93 may be either straight-chain, branched or
15 optionally halogenated.

The term "aryl" means in particular a phenyl or naphthyl group.

A "tricyclic system" means structures having 3 rings which are connected
20 together by more than one bond. Examples of such systems are fused systems with 3 rings and spirocycles with a ring system fused on.

In the case where R1 and R2 form together with the nitrogen atom to which they are bonded a ring, this ring may be substituted by one or more of the
25 substituents mentioned.

The bivalent carbo- or heterocyclic ring structure E includes structures which are linked by one and the same atom to the two adjacent groups K and X.
30

Pharmaceutically acceptable salts are, because their solubility in water is greater than that of the initial or basic compounds, particularly suitable for medical applications. These salts must have a pharmaceutically acceptable anion or cation. Suitable pharmaceutically acceptable acid addition salts of
35 the compounds of the invention are salts of inorganic acids such as hydrochloric acid, hydrobromic, phosphoric, metaphosphoric, nitric, sulfonic and sulfuric acid, and of organic acids such as, for example, acetic acid, benzenesulfonic, benzoic, citric, ethanesulfonic, fumaric, gluconic, glycolic, isethionic, lactic, lactobionic, maleic, malic, methanesulfonic, succinic,

p-toluenesulfonic, tartaric and trifluoroacetic acid. For medical purposes the chlorine salt is particularly preferably used. Suitable pharmaceutically acceptable basic salts are ammonium salts, alkali metal salts (such as sodium and potassium salts), alkaline earth metal salts (such as
5 magnesium and calcium salts).

Salts with a pharmaceutically unacceptable anion likewise belong within the framework of the invention as useful intermediates for the preparation or purification of pharmaceutically acceptable salts and/or for use in
10 nontherapeutic, for example in vitro, applications.

The term "physiologically functional derivative" used herein refers to any physiologically tolerated derivative of a compound of the formula I of the invention, for example an ester, which on administration to a mammal such
15 as, for example, a human is able to form (directly or indirectly) a compound of the formula I or an active metabolite thereof.

Physiologically functional derivatives include prodrugs of the compounds of the invention. Such prodrugs can be metabolized in vivo to a compound of
20 the invention. These prodrugs may themselves be active or not.

The compounds of the invention may also exist in various polymorphous forms, for example as amorphous and crystalline polymorphous forms. All polymorphous forms of the compounds of the invention belong within the
25 framework of the invention and are a further aspect of the invention.

All references to "compound(s) of formula (I)" hereinafter refer to compound(s) of the formula (I) as described above, and their salts, solvates and physiologically functional derivatives as described herein.
30

If radicals or substituents can occur more than once in the compounds of the formula I, they may all have independently of one another the stated meanings and be identical or different.

35 In a particularly preferred embodiment, the present invention relates to compounds of the formula I in which the meanings are:

R1, R2 are each independently H, (C₁-C₈)-alkyl, -(CH₂)_o -R12, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, CO-(C₁-C₈)-alkyl, -CO-(CH₂)_o -R12, COCH=CH(R13), COCC(R14), CO-(C₁-C₄)-alkyl-S(O)_p-(C₁-C₄)-alkyl, CO(C(R15)(R16))_qN(R17)(R18),
 5 CO(C(R19)(R20))_rCON(R21)(R22) or CO(C(R23)(R24))_sO(R25); or R1 and R2 together with the nitrogen atom to which they are attached, optionally form a 4-, 5-, 6-, 7, 8-, 9- or 10-membered mono-, bi- or spirocyclic ring which, apart from the nitrogen atom, may comprise 0 to 2
 10 additional heteroatoms selected from the group of oxygen, nitrogen and sulfur, where the heterocyclic ring system may additionally be substituted by F, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl, (C₀-C₈)-alkylene-aryl, oxo, CO(R26), CON(R27)(R28), hydroxy, COO(R29), N(R30)CO(C₁-C₆)-alkyl, N(R31)(R32) or
 15 SO₂CH₃, where R1 and R2 are preferably not both H, and R1 and R2 together with the nitrogen atom are preferably not a morpholino radical;

o 0, 1, 2, 3, 4;
 20 p 0, 1, 2;

q, r, s independently of one another 0, 1, 2, 3, preferably q, s are independently of one another 1, 2, 3 and r is 0, 1, 2, 3;
 25 R13, R14 independently of one another a 5-10 membered aromatic ring system which may comprise a further heteroatom from the group of nitrogen, oxygen and sulfur and may be substituted by F, Cl, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl;

R15, R16, R17, R19, R20, R21, R22, R23, R24, R25, R26,
R27, R28, R29, R30, R31, R32

independently of one another H, (C₁-C₆)-alkyl;

5 R18 H, (C₁-C₆)-alkyl, CO(C₁-C₆)-alkyl, CO(R33);

R17 and R18, R21 and R22, R27 and R28, R31 and R32

10 independently of one another optionally together with the
nitrogen atom to which they are bonded a 5-6 membered ring
which, apart from the nitrogen atom, may also comprise 0-1
further heteroatoms from the group of N-(C₁-C₆)-alkyl, oxygen
and sulfur;

15 R33 a 5-10 membered aromatic ring system which may comprise
a further heteroatom from the group of nitrogen, oxygen and
sulfur and may be substituted by F, Cl, (C₁-C₆)-alkyl, O-(C₁-
C₈)-alkyl;

20 R12 OH, 3-12 membered mono-, bi- or spirocyclic ring which may
comprise one or more heteroatoms from the group of N, O
and S, and the 3-12 membered ring may comprise further
substituents such as F, Cl, CF₃, CN, oxo, O-(C₁-C₆)-alkyl,
(C₁-C₆)-alkyl, O-(C₀-C₈)-alkylene-aryl, N(R34)(R35),
COCH=CH(R36), (C(R37)(R38))_t (R39), CO(C(R37)(R38))_t
25 (R39), CO(C₁-C₆)-alkyl, COCOO(C₁-C₆)-alkyl, COO(R40)
and S(O)_u (R41), where in a preferred embodiment the
substituent O-(C₁-C₆)-alkyl is excluded when the 3-12
membered ring is phenyl;

30 t 0, 1, 2, 3, 4;

u 0, 1, 2;

R34, R35, R37, R38

independently of one another H, (C₁-C₈)-alkyl;

5

R34 and R35

optionally together with the nitrogen atom to which they are bonded a 5-6 membered ring which, apart from the nitrogen atom, may also comprise 0-1 further heteroatoms from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur and may optionally be substituted by 1-2 oxo groups;

10

R36, R39 independently of one another (C₃-C₈)-cycloalkyl, 5-10 membered aromatic ring system which may comprise a further heteroatom from the group of nitrogen, oxygen and sulfur and may be substituted by F, Cl, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl;

15

R40 H, (C₁-C₈)-alkyl, (C₂-C₆)-alkenyl, (C₀-C₈)-alkylene-aryl;

20

R41 (C₁-C₆)-alkyl, 5-10 membered aromatic ring system which may comprise 0-2 further heteroatoms from the group of nitrogen, oxygen and sulfur and may be substituted by F, Cl, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl;

25

R3 H, (C₁-C₆)-alkyl;

R4, R5 independently of one another H, (C₁-C₆)-alkyl, OH, O-(C₁-C₆)-alkyl, O-CO(C₁-C₆)-alkyl;

30

R6, R7, R8, R9

independently of one another H, (C₁-C₈)-Alkyl;

R6 and R7, R8 and R9

5 independently of one another optionally oxo;

n, m independently of one another 0, 1, 2, preferably m is 0, 1, 2
and n is 1;

10 A, B, D, G independently of one another N, C(R42);

R42 is H, F, Cl, Br, CF₃, CN, O-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl,
(C₃-C₈)-cycloalkyl, (C₀-C₂)-alkylene-aryl, O-(C₀-C₂)-alkylene-
aryl, N(R43)(R44), SO₂-CH₃, COO-(C₁-C₆)-alkyl,
15 CON(R45)(R46), N(R47)CO(R48), N(R49)SO₂(R50),
CO(R51)

R43, R44, R45, R46, R47, R49

independently of one another H, (C₁-C₈)-alkyl;

20

R43 and R44, R45 and R46

independently of one another optionally together with the
nitrogen atom to which they are bonded a 5-6 membered ring
which, apart from the nitrogen atom, may also comprise 0-1
25 further heteroatoms from the group of N-(C₁-C₆)-alkyl, oxygen
and sulfur;

R48, R50, R51

independently of one another H, (C₁-C₈)-alkyl, aryl;

30

R10 H, (C₁-C₈)-alkyl;

X N(R52), O, a bond, C=C, C(R53)(R54), C(R55)(R56)O;

R52, R53, R54, R55, R56

5 independently of one another H, (C₁-C₈)-alkyl

E 3-8 membered bivalent carbo- or heterocyclic ring structure with 0-4 heteroatoms from the group of N, O and S, which may optionally have substituents from the group of H, F, Cl, CF₃, NO₂, OH, CN, O-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, (C₀-C₈)-alkylene-aryl, O-(C₀-C₈)-alkylene-aryl, N(R57)(R58), SO₂-CH₃, COO-(C₁-C₆)-alkyl, CON(R59)(R60), N(R61)CO(R62), N(R63)SO₂(R64), CO(R65) and may be mono- or bicyclic, preferably the group E has no substituents from the group of (C₀-C₈)-alkylene-aryl, O-(C₀-C₈)-alkylene-aryl and N(R57)(R58), in which R57 and R58 form together with the nitrogen atom a 5-6 membered ring, in the position ortho to the point of attachment of X; particularly preferably E is monocyclic;

20

R57, R58, R59, R60, R61, R63

independently of one another H, (C₁-C₈)-alkyl;

25 R57 and R58, R59 and R60

independently of one another optionally together with the nitrogen atom to which they are bonded a 5-6 membered ring which, apart from the nitrogen atom, may also comprise 0-1 further heteroatoms from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur, where R59 and R60 are preferably not both H;

30

R62, R64, R65

independently of one another H, (C₁-C₈)-alkyl, aryl;

5 K a bond, O, CH₂O, N(R66), (C(R69)(R70))_v, C≡C, OCH₂,
CON(R68), preferably a bond, O, CH₂O, ((CR69)(R70))_v,
C≡C, N(R66);

v 1, 2;

10 R66, R68, R69, R70

independently of one another H, (C₁-C₈)-alkyl;

15 R11 H, (C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, (C₃-C₈)-
alkenyl, a 3 to 10-membered mono-, bi- or spirocyclic ring
which may comprise 0 to 4 heteroatoms selected from the
group of oxygen, nitrogen and sulfur, where the ring system
may additionally be substituted by F, Cl, Br, CF₃, NO₂, CN,
(C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl,
(C₀-C₈)-alkylene-aryl, oxo, CO(R71), CON(R72)(R73),
20 hydroxy, COO(R74), N(R75)CO(C₁-C₆)-alkyl, N(R76)(R77) or
SO₂CH₃, preferably R11 is not COO(R74);

R71, R72, R73, R74, R75, R76, R77

independently of one another H, (C₁-C₈)-alkyl;

25

R72 and R73, R76 and R77

independently of one another optionally together with the
nitrogen atom to which they are bonded a 5-6 membered ring
which, apart from the nitrogen atom, may also comprise 0-1
30 further heteroatoms from the group of N-(C₁-C₆)-alkyl, oxygen

and sulfur.

Particularly preferred compounds of the formula I are those in which

- 5 A, B, D, G are independently of one another N or C(R₄₂), and the total number of nitrogen atoms in this ring is 0-2, preferably 0 or 1.

Very particularly preferred compounds of the formula I are those in which

- 10 n is 1 and
 m is 1 or 2.

Especially preferred compounds of the formula I are those in which

- 15 A, B, D, G are independently of one another N or C(R₄₂) and the total number of nitrogen atoms in this ring is 0-2, preferably 0 or 1;

n is 1 and

- 20 m is 1 or 2.

In a further preferred embodiment, the present invention relates to compounds of the formula I in which the meanings are:

25

R₁, R₂ independently of one another are H, (C₁-C₈)-alkyl, -
 (CR₇₈R₇₉)_o -R₁₂, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, (C₃-C₈)-
 alkenyl, CO-(C₁-C₈)-alkyl, -CO-(CH₂)_o-R₁₂, CO-aryloxy-
 (C₁-C₄)-alkyl, COCH=CH(R₁₃), COCC(R₁₄),
30 CO(C(R₁₅)(R₁₆))_qN(R₁₇)(R₁₈),
 CO(C(R₁₉)(R₂₀))_rCON(R₂₁)(R₂₂),
 CO(C(R₂₃)(R₂₄))_sO(R₂₅); or R₁ and R₂ form together with

the nitrogen atom to which they are bonded a 4 to 10-membered mono-, bi- or spirocyclic ring which, apart from the nitrogen atom, may comprise 0 to 2 additional heteroatoms selected from the group of oxygen, nitrogen and sulfur, where the heterocyclic ring system may additionally be substituted by F, Cl, CF₃, (C₁-C₆)-alkyl, O-(C₁-C₄)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, hydroxy-(C₁-C₄)-alkyl, (C₀-C₂)-alkylene-aryl, oxo, CO(R₂₆), CON(R₂₇)(R₂₈), hydroxy, COO(R₂₉), N(R₃₀)CO(C₁-C₆)-alkyl, N(R₃₁)(R₃₂) or SO₂CH₃;

preferably independently of one another H, (C₁-C₈)-alkyl, -(CR₇₈R₇₉)_o -R₁₂, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, CO-(C₁-C₈)-alkyl, -CO-(CH₂)_o -R₁₂, COCH=CH(R₁₃), COCC(R₁₄), CO(C(R₁₅)(R₁₆))_qN(R₁₇)(R₁₈), CO(C(R₂₃)(R₂₄))_sO(R₂₅);

or R₁ and R₂ form together with the nitrogen atom to which they are bonded a 4 to 10-membered mono- or bicyclic ring which, apart from the nitrogen atom, may comprise 0 to 2 additional heteroatoms selected from the group of oxygen, nitrogen and sulfur, where the heterocyclic ring system may additionally be substituted by F, Cl, CF₃, (C₁-C₆)-alkyl, O-(C₁-C₄)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, (C₀-C₂)-alkylene-aryl, oxo, CO(R₂₆), hydroxy, N(R₃₁)(R₃₂) or SO₂CH₃;

particularly preferably independently of one another H, (C₁-C₈)-alkyl, -(CR₇₈R₇₉)_o -R₁₂, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, CO-(C₁-C₈)-alkyl, -CO-(CH₂)_o -R₁₂, CO(C(R₁₅)(R₁₆))_qN(R₁₇)(R₁₈), or R₁ and R₂ form together with the nitrogen atom to which they are bonded a 4 to 10-membered mono - or bicyclic ring which, apart from the nitrogen atom, may comprise 0 to 2 additional heteroatoms

selected from the group of oxygen and nitrogen, where the heterocyclic ring system may be additionally substituted by F, (C₁-C₆)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, oxo, CO(R₂₆), hydroxy, N(R₃₁)(R₃₂);

5

o 0, 1, 2, 3, 4, 5, 6; preferably 0, 1, 2, 3, 4; particularly preferably 0, 1, 2, 3;

q, r independently of one another 1, 2, 3; preferably q is 1 or 2;

10

s 0, 1, 2, 3, 4; preferably 0, 1, 2, 3; particularly preferably 0, 1, 2;

R₁₃, R₁₄ independently of one another are a phenyl ring which may comprise 0-1 nitrogen atoms;

15

R₁₅, R₁₆, R₁₇, R₁₉, R₂₀, R₂₁, R₂₂, R₂₃, R₂₄, R₂₅, R₂₆, R₂₇, R₂₈, R₂₉, R₃₀, R₃₁, R₃₂

independently of one another H, (C₁-C₆)-alkyl;

20

R₁₈ H, (C₁-C₆)-alkyl, CO(C₁-C₆)-alkyl, CO(R₃₃); preferably H, (C₁-C₆)-alkyl, CO(C₁-C₆)-alkyl; particularly preferably H, (C₁-C₆)-alkyl;

or

25 R₁₇ and R₁₈, R₂₁ and R₂₂, R₂₇ and R₂₈, R₃₁ and R₃₂

independently of one another optionally form together with the nitrogen atom to which they are bonded a 5-6 membered ring which, apart from the nitrogen atom, may also comprise 0-1 further heteroatoms from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur; preferably the ring is pyrrolidine, piperidine, N-methylpiperazine, morpholine;

30

- R33 a 5-10 membered aromatic ring system which may comprise a further heteroatom from the group of nitrogen, oxygen and sulfur and may be substituted by F, Cl, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl;
- 5
- R12 OH, O-(C₁-C₆)-alkyl, O-(C₀-C₈)-alkylene-aryl, CN, S-(C₁-C₆)-alkyl, COO(R80), CON(R81)(R82), 3-12 membered mono-, bi- or spirocyclic ring which may comprise one or more heteroatoms from the group of N, O and S, and the 3-12 membered ring may comprise further substituents such as F, Cl, Br, OH, CF₃, CN, oxo, O-(C₁-C₆)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, (C₁-C₆)-alkyl, O-(C₀-C₈)-alkylene-aryl, (C₀-C₈)-alkylene-aryl, N(R34)(R35), COCH=CH(R36), (C(R37)(R38))_t (R39), CO(C(R37)(R38))_t (R39), CO(C₁-C₆)-alkyl, COCOO(C₁-C₆)-alkyl, COO(R40), S(O)_u (R41); preferably OH, O-(C₁-C₆)-alkyl, O-(C₀-C₈)-alkylene-aryl, CN, 3-10 membered mono- or bicyclic ring which may comprise 1-3 heteroatoms from the group of N, O and S, and the 3-10 membered ring may comprise further substituents such as F, Cl, Br, OH, CF₃, CN, oxo, O-(C₁-C₆)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, (C₁-C₆)-alkyl, (C₀-C₂)-alkylene-aryl, N(R34)(R35), CO(C₁-C₆)-alkyl; particularly preferably OH, O-(C₁-C₆)-alkyl, 3-10 membered mono- or bicyclic ring which may comprise 1-2 heteroatoms from the group of N, O and S, and the 3-10 membered ring may comprise further substituents such as F, OH, oxo, (C₁-C₆)-alkyl, CO(C₁-C₆)-alkyl;
- 10
- 15
- 20
- 25
- t 0, 1, 2, 3, 4, 5, 6;

u 0, 1, 2; preferably 0 or 2; particularly preferably 2;

R34, R35, R37, R38

independently of one another H, (C₁-C₈)-alkyl;

5 or
R34 and R35

optionally together with the nitrogen atom to which they are
bonded a 5-6 membered ring which, apart from the nitrogen
atom, may also comprise 0-1 further heteroatoms from the
10 group of N-(C₁-C₆)-alkyl, oxygen and sulfur and may
optionally be substituted by 1-2 oxo groups;

R36, R39 independently of one another (C₃-C₈)-cycloalkyl, 5-10
membered aromatic ring system which may comprise 0-2
15 further heteroatoms from the group of nitrogen, oxygen and
sulfur and may be substituted by F, Cl, (C₁-C₆)-alkyl, O-(C₁-
C₈)-alkyl;

R40 H, (C₁-C₈)-alkyl, (C₂-C₆)-alkenyl, (C₀-C₈)-alkylene-aryl;
20

R41 (C₁-C₆)-alkyl, 5-10 membered aromatic ring system which
may comprise 0-2 further heteroatoms from the group of
nitrogen, oxygen and sulfur and may be substituted by F, Cl,
(C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl;
25

R78, R79 independently of one another H, (C₁-C₈)-alkyl, hydroxy-
(C₁-C₄)-alkyl, OH, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl;

R80, R81 independently of one another H, (C₁-C₈)-alkyl;
30

- R3 H, (C₁-C₆)-alkyl; preferably H;
- R4, R5 independently of one another H, (C₁-C₆)-alkyl, OH,
O-(C₁-C₆)-alkyl, O-CO-(C₁-C₆)-alkyl, S-(C₁-C₆)-alkyl;
preferably independently of one another H, (C₁-C₆)-alkyl, OH,
5 O-(C₁-C₆)-alkyl, O-CO-(C₁-C₆)-alkyl; particularly preferably
independently of one another H, OH, O-(C₁-C₆)-alkyl;
- R6, R7, R8, R9
H;
- 10 or
R6 and R7, R8 and R9
independently of one another optionally oxo;
preferably R6, R7, R8, R9 are H;
- n 1
- 15 m 1 or 2; preferably 1;
- A, B, D, G independently of one another N, C(R42);
or
the groups A and B or D and G are each C(R42) and together
20 form an ortho-phenylene unit to result overall in a 1,4-
bisubstituted naphthalene system;
preferably
B is N, C(R42); and A, D, G C(R42);
particularly preferably
- 25 A, B, D, G are C(R42);
- R42 H, F, Cl, Br, CF₃, CN, O-(C₁-C₆)-alkyl, O-(C₁-C₄)-alkoxy-(C₁-
C₄)-alkyl, S-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, (C₀-C₈)-alkylene-
aryl, O-(C₀-C₈)-alkylene-aryl, N(R43)(R44), SO₂-CH₃,
30 CON(R45)(R46), N(R47)CO(R48), CO(R51), -(CR₄R₅)_x-

O(R86);

preferably H, F, Cl, Br, CF₃, CN, O-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, SO₂-CH₃, CON(R45)(R46), N(R47)CO(R48), CO(R51),
-(CR84R85)_x-O(R86);

5 particularly preferably H, F, Cl, CF₃, CN, (C₁-C₆)-alkyl,
-(CR84R85)_x-O(R86);

R43, R44, R45, R46, R47

independently of one another H, (C₁-C₈)-alkyl;

or

10 R43 and R44, R45 and R46

independently of one another optionally together with the
nitrogen atom to which they are bonded a 5-6 membered ring
which, apart from the nitrogen atom, may also comprise 0-1
further heteroatoms from the group of N-(C₁-C₆)-alkyl, oxygen
15 and sulfur;

R48, R50, R51

independently of one another H, (C₁-C₈)-alkyl, aryl; preferably
independently of one another H, (C₁-C₈)-alkyl;

20 R84, R85 H;

R86 H, (C₁-C₆)-alkyl;

x 0, 1, 2; preferably 0, 1; particularly preferably 1;

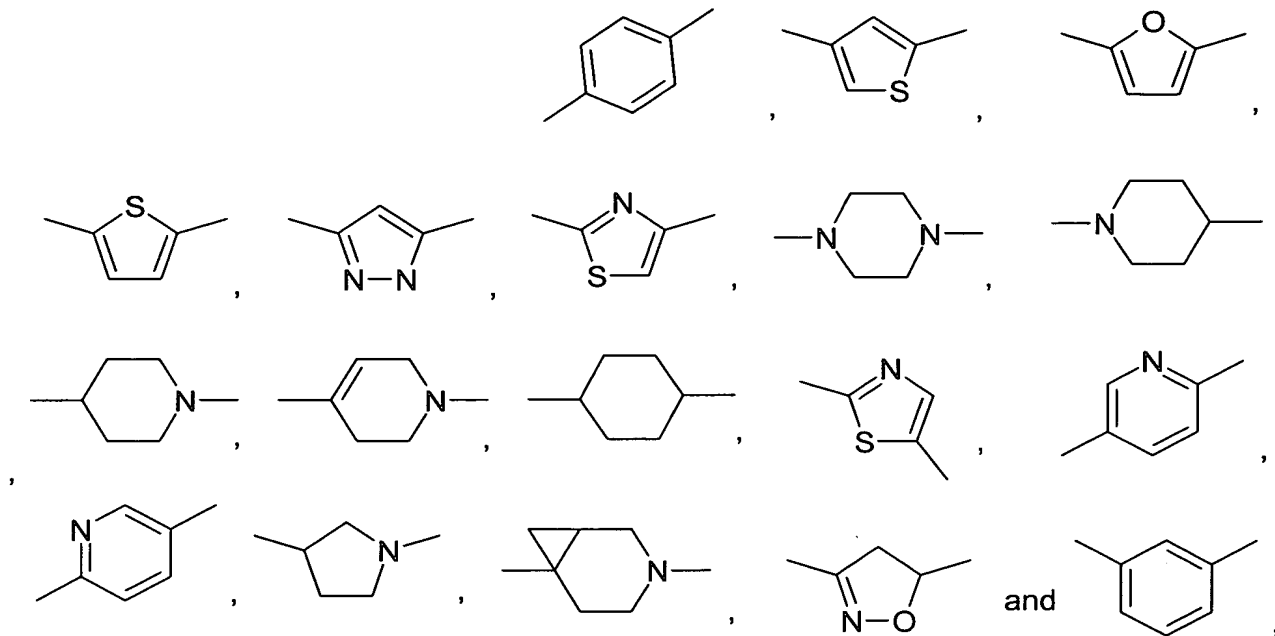
25 R10 H, (C₁-C₈)-alkyl;

X N(R52), a bond, C=C, C(R53)(R54), C(R55)(R56)O, C≡C,
CH₂-CH₂, YCH₂; preferably N(R52), a bond, C=C,
C(R53)(R54), CH₂-CH₂; particularly preferably a bond, C=C,

		C(R53)(R54), CH ₂ -CH ₂ ;
	Y	O, S, N(R89);
	R89	H, (C ₁ -C ₈)-alkyl;
5		R52, R53, R54, R55, R56
		independently of one another H, (C ₁ -C ₈)-alkyl;
10	E	3-8 membered bivalent carbo- or heterocyclic ring structure with 0-4 heteroatoms from the group of N, O and S, which may optionally have substituents from the group of H, F, Cl, Br, OH, CF ₃ , NO ₂ , CN, OCF ₃ , O-(C ₁ -C ₆)-alkyl, O-(C ₁ -C ₄)-alkoxy-(C ₁ -C ₄)-alkyl, S-(C ₁ -C ₆)-alkyl, (C ₁ -C ₆)-alkyl, (C ₂ -C ₆)-alkenyl, O-(C ₃ -C ₈)-cycloalkyl, (C ₃ -C ₈)-cycloalkenyl, (C ₂ -C ₆)-alkynyl, (C ₀ -C ₈)-alkylene-aryl, O-(C ₀ -C ₈)-alkylene-aryl, S-aryl, N(R57)(R58), SO ₂ -CH ₃ , N(R61)CO(R62), N(R63)SO ₂ (R64), CO(R65) and may be mono- or bicyclic;
15		preferably 5-7 membered bivalent carbo- or heterocyclic ring structure with 0-3 heteroatoms from the group of N, O and S, which may optionally have substituents from the group of H, F, Cl, Br, OH, CF ₃ , NO ₂ , CN, OCF ₃ , O-(C ₁ -C ₆)-alkyl, S-(C ₁ -C ₆)-alkyl, (C ₁ -C ₆)-alkyl, (C ₂ -C ₆)-alkenyl, O-(C ₀ -C ₈)-alkylene-aryl, S-aryl, N(R57)(R58), SO ₂ -CH ₃ , N(R61)CO(R62), CO(R65) and may be mono- or bicyclic;
20		particularly preferably 5-7 membered bivalent carbo- or heterocyclic ring structure with 0-2 heteroatoms from the group of N, O and S, which may optionally have substituents from the group of H, F, Cl, Br, OH, CF ₃ , NO ₂ , OCF ₃ , O-(C ₁ -C ₆)-alkyl, (C ₁ -C ₆)-alkyl, (C ₂ -C ₆)-alkenyl, N(R57)(R58),
25		

SO₂-CH₃, CO(R65)

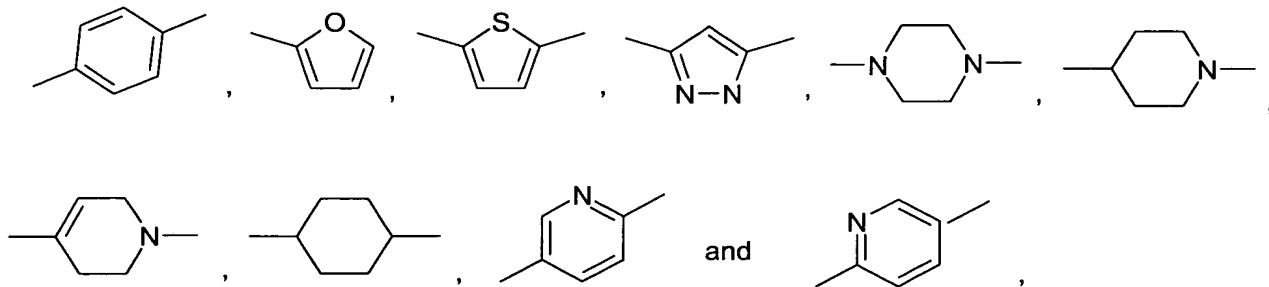
e.g. E is selected from the group consisting of



5

which may optionally have substituents from the group of H, F, Cl, Br, OH, CF₃, NO₂, OCF₃, O-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl, N(R57)(R58), SO₂-CH₃, CO(R65);

10 preferably



which may optionally have the aforementioned substituents;

15

R57, R58, R61, R63

independently of one another H, (C₁-C₈)-alkyl;

R62, R64, R65

independently of one another H, (C₁-C₈)-alkyl, aryl; preferably

5 independently of one another H, (C₁-C₈)-alkyl;

K

a bond, O, OCH₂, CH₂O, S, SO, SO₂, N(R66), N(R67)CO, CON(R68), (C(R69)(R70))_v, CO, C=C, C≡C, SCH₂, SO₂CH₂;

preferably a bond, O, OCH₂, CH₂O, N(R66), CON(R68),

10 (C(R69)(R70))_v, CO, C≡C, SCH₂; particularly preferably a

bond, O, OCH₂, CH₂O, CON(R68), (C(R69)(R70))_v, CO, C≡C;

v

1, 2, 3, 4; preferably 1, 2, 3; particularly preferably 1,2;

15

R66, R67, R68, R69, R70

independently of one another H, (C₁-C₈)-alkyl;

R11

H, (C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, (C₃-C₈)-

20

alkenyl, (C₃-C₈)-alkynyl, a 3 to 10-membered mono-, bi-, tri- or spirocyclic ring, which may comprise 0 to 4 heteroatoms selected from the group of oxygen, nitrogen and sulfur, where the ring system may additionally be substituted by F,

Cl, Br, CF₃, CN, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl, (C₁-C₄)-

25

alkoxy-(C₁-C₄)-alkyl, hydroxy-(C₁-C₄)-alkyl, (C₀-C₈)-alkylene-aryl, oxo, CO(R71), CON(R72)(R73), hydroxy, COO(R74), N(R75)CO(C₁-C₆)-alkyl, N(R76)(R77) or SO₂CH₃;

preferably (C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, a 3 to 10-membered mono-, bi-, tri- or spirocyclic ring which may

- comprise 0 to 3 heteroatoms selected from the group of oxygen, nitrogen and sulfur, where the ring system may additionally be substituted by F, Cl, Br, CF₃, CN, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl, (C₀-C₂)-alkylene-aryl, oxo, CO(R71),
- 5 CON(R72)(R73), hydroxy, N(R75)CO(C₁-C₆)-alkyl, N(R76)(R77) or SO₂CH₃;
- particularly preferably (C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, a 3 to 10-membered mono- or bicyclic ring which may
- 10 comprise 0 to 2 heteroatoms selected from the group of oxygen, nitrogen and sulfur, where the ring system may additionally be substituted by F, Cl, Br, CF₃, CN, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl, oxo, CO(R71), CON(R72)(R73), N(R75)CO(C₁-C₆)-alkyl, or SO₂CH₃;
- 15 R71, R72, R73, R74, R75, R76, R77
- independently of one another H, (C₁-C₈)-alkyl;
- or
- R72 and R73, R76 and R77
- 20 independently of one another optionally together with the nitrogen atom to which they are bonded a 5-6 membered ring which, apart from the nitrogen atom, may also comprise 0-1 further heteroatoms from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur; or
- 25 the N-oxides and the physiologically tolerated salts thereof.

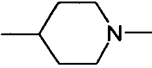
In a further preferred embodiment, A, B, G and D in formula I are CH or:

- If E is 1,4-phenylene, the preferred meanings for A, B, G and D are
- 30 furthermore those listed in table I below:

Table I:

A	B	G	D
N	CH	CH	CH
CH	N	CH	CH
C-Cl	N	CH	CH
C-F	CH	C-F	CH
CH	CH	C-F	CH
CH	C-F	CH	CH
CH	CH	CH	CF
CH	C-Br	CH	CH
CH	CH	C-Br	CH
CH	C-Cl	CH	CH
CH	CH	C-Cl	CH
CH	CH	C-CN	CH
CH	CH	CH	C-CN
CH	CH	C-CH ₃	CH
CH	CH	CH	C-CH ₃
CH	CH	C-CF ₃	CH
CH	CH	CH	C-CF ₃
CH	CH	CH	CH ₂ OH
CH	C-F	CH	C-F
CH	C-F	C-F	CH
CH	CH	C-F	C-F
CH	CH	C-F	C-Cl
CH	CH	C-Cl	C-CN
CH	C-CH ₃	C-Cl	CH
CH	N	CH	C-CH ₃
CH	C-CH ₃	CH	N
CH	N	C-CH ₃	CH

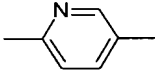
CH	CH	
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If E is , the preferred meanings for A, B, G and D are furthermore those listed in table II below:

5

Table II:

A	B	G	D
CH	C-CH ₃	CH	CH
CH	C-F	CH	CH
CH	CH	C-CH ₃	CH
CH	CH	C-F	CH
CH	N	CH	CH
CH	CH	CH	N
C-F	CH	C-F	CH

If E is , the preferred meanings for A, B, G and D are furthermore those listed in table III below:





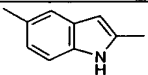
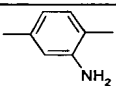
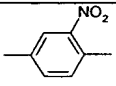
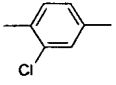
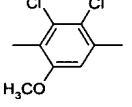
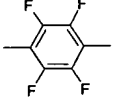
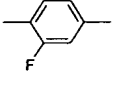
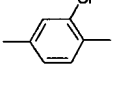
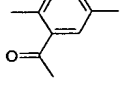

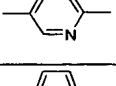
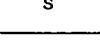
10

Table III:

A	B	G	D
CH	CH	C-F	CH
CH	N	CH	CH
CH	CH	CH	N

15 Further preferred combinations for E and A, B, G and D are listed in table IV.

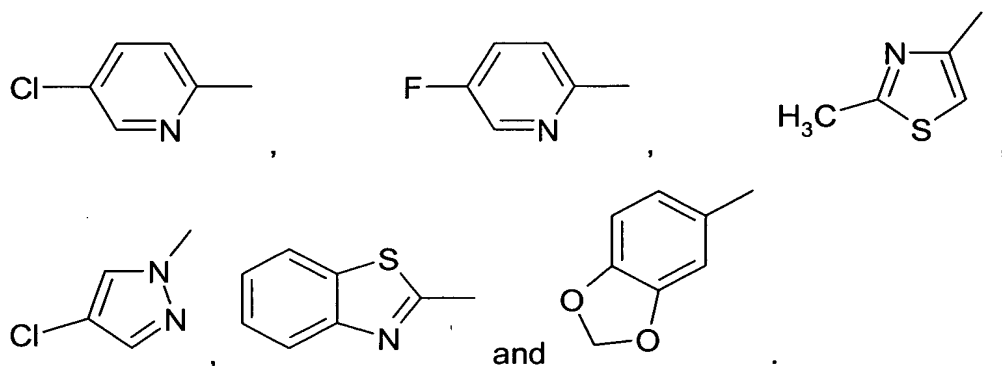
Table IV:

E	A	B	G	D
	CH	C-F	CH	CH
	CH	CH	C-F	CH
	CH	C-F	CH	CH
	CH	C-F	CH	CH
	CH	CF	CH	CH
	CH	CF	CH	CH
	CH	C-F	CH	CH
	CH	C-F	CH	CH
	CH	C-F	CH	CH
	CH	C-F	CH	CH
	CH	C-F	CH	CH
	CH	C-F	CH	CH
	CH	C-F	CH	CH
	CH	C-F	CH	CH
	CH	C-F	CH	CH
	CH	C-F	CH	CH

The radicals R11, K, X and E in formula I have in a particularly preferred embodiment one of the following meanings:

R11 is preferably selected from the group consisting of:

- 5 n-propyl, n-butyl, iso-butyl, iso-pentyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclohex-(1)-enyl, phenyl, p-fluorophenyl, p-chlorophenyl, p-bromophenyl, p-tolyl, p-methoxyphenyl, p-trifluoromethylphenyl, p-methylthiophenyl, o-fluorophenyl, o-chlorophenyl, o-cyanophenyl, m-fluorophenyl, 2,4-difluorophenyl, 3-fluoro-4-methylphenyl, 2-nitro-4-
- 10 methylphenyl, 2-amino-4-methylphenyl,

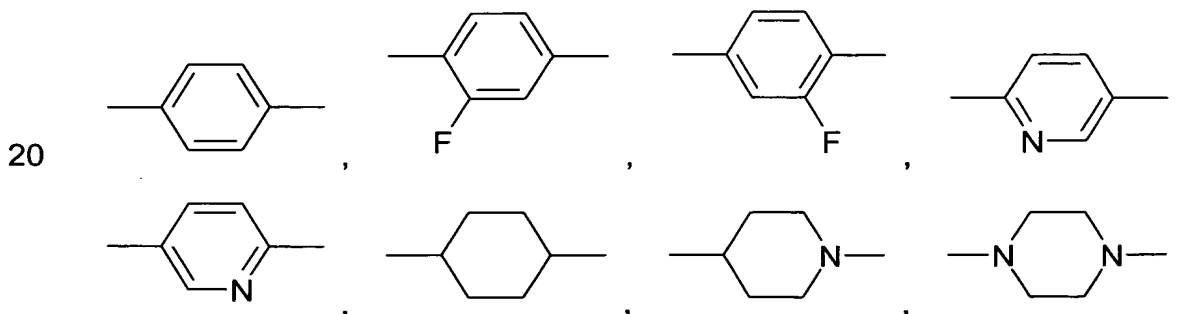


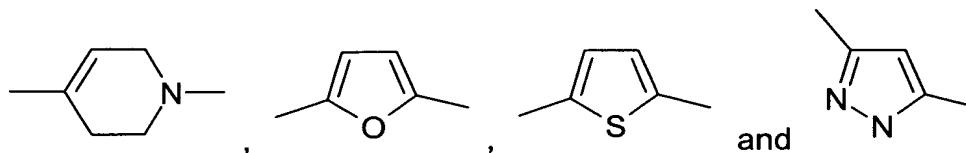
K is preferably selected from the group consisting of:

- 15 -O-, bond, $C \equiv C$, CH_2 , CH_2O , $CONH$, OCH_2 , CO , SCH_2 and $(CH_2)_2O$.

X is preferably selected from the group consisting of bond, NH and CH_2 .

E is preferably selected from the group consisting of:



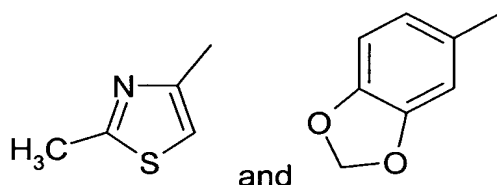


Preferred combinations of R11, K, X and E are listed below:

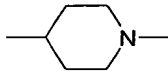
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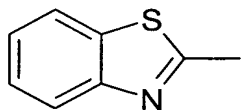
If K and X are each a bond, the particularly preferred meanings for E and R11 are as follows:

- 10
- If E is 1,4-phenylene, R11 is selected from the group consisting of: cyclohexyl, p-tolyl, p-fluorophenyl, o-fluorophenyl, p-methoxyphenyl, p-chlorophenyl, o-chlorophenyl, 2,4-difluorophenyl, 3-fluoro-4-methylphenyl, o-cyanophenyl,



15

- If E is , R11 selected from the group consisting of: p-chlorophenyl, p-tolyl, p-fluorophenyl, p-methoxyphenyl, p-trifluoromethylphenyl, o-fluorophenyl, phenyl and



- 20 Further combinations of E and R11 for the case where K and X are each a bond are listed in table V:

Table V:

R11	E
p-Chlorophenyl	1,4-Cyclohexylene

2-Nitro-4-methylphenyl	
p-Chlorophenyl	
p-Bromophenyl	
p-Fluorophenyl	
p-Chlorophenyl	
p-Tolyl	
n-Butyl	
p-Chlorophenyl	
p-Methylthiophenyl	
2-Amino-4-methylphenyl	

If K is $-O-$ and X is a bond, NH or CH_2 , the particularly preferred meanings for E and R11 are as follows:

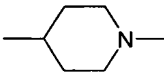
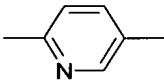
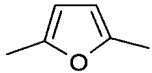
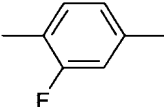
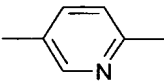
5

- If E is 1,4-phenylene, R11 is selected from the group consisting of:

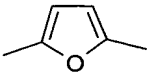
phenyl, cyclopentyl, n-butyl, iso-butyl, iso-pentyl, 2,4-difluorophenyl and p-fluorophenyl.

- Further combinations of E and R11 for the case where K is –O- and X is a
 5 bond, NH or CH₂ are listed in table VI:

Table VI:

R11	E
Phenyl	
Cyclopentyl	
Phenyl	
n-Butyl	
n-Butyl	

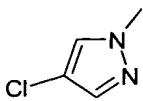
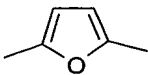
- 10 If K is C≡C and X is a bond, the particularly preferred meanings of E and R11 are as follows:

- If E is  , R11 is selected from the group consisting of:
 phenyl, p-fluorophenyl and p-chlorophenyl.

15

If K is CH₂ and X is a bond, the particularly preferred meanings of E and R11 are indicated in table VII below:

- 20 Table VII:

R11	E
Phenyl	1,4-Phenylene
	1,4-Phenylene
p-Chlorophenyl	

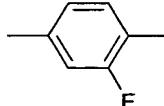
If K is CH₂O and X is a bond, the particularly preferred meanings of E and R11 are as follows:

5

- If E is 1,4-phenylene, R11 is selected from the group consisting of: phenyl, cyclopropyl and cyclohexyl.

- 10 If K is CONH and X is a bond, the particularly preferred meanings of E and R11 are indicated in table VIII below:

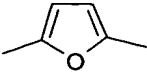
Table VIII:

R11	E
Cyclopentyl	1,4-Phenylene
Cyclohex-(1)-enyl	1,4-Phenylene
Cyclopentyl	

- 15 If K is OCH₂ and X is a bond, the particularly preferred meanings of E and R11 are indicated in table IX below:

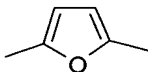
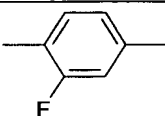
Table IX:

R11	E
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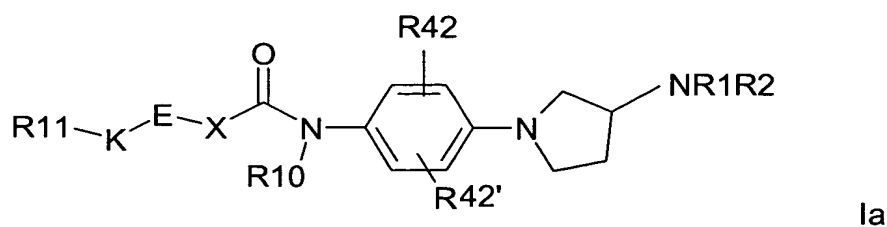
o-Chlorophenyl	
p-Tolyl	1,4-Phenylene
n-Propyl	1,4-Phenylene
Cyclobutyl	1,4-Phenylene

- The combinations of R11, K and E listed in table X below are furthermore particularly preferred in addition to the aforementioned combinations, with
- 5 X very particularly preferably being a bond:

Table X:

R11	K	E
o-Fluorophenyl	CO	
Phenyl	SCH ₂	1,4-Phenylene
Cyclopropyl	(CH ₂) ₂ O	

- 10 The compounds of the formula I are in a very particularly preferred embodiment compounds of the formula Ia



- 15 in which the radicals R1, R2, R10, R11, R42, and groups X, E, K have the aforementioned meanings, and R42' is defined as R42, where R42 and R42' in the compounds of the formula Ia may be identical or different, or the N-oxides and the physiologically tolerated salts thereof.

In a preferred embodiment of the invention, the radicals R1, R2, R10, R11, R42, R42' and groups X, E, K have the following meanings:

- 5 R1, R2 independently of one another H, (C₁-C₈)-alkyl, -(CR₇₈R₇₉)_o
 -R12, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, or R1 and R2 form
 together with the nitrogen atom to which they are bonded a 4
 to 10-membered mono-, bi- or spirocyclic ring which, apart
 10 from the nitrogen atom, may comprise 0 to 2 additional
 heteroatoms selected from the group of oxygen, nitrogen and
 sulfur, where the heterocyclic ring system may additionally be
 substituted by F, (C₁-C₆)-alkyl, O-(C₁-C₄)-alkyl, (C₁-C₄)-
 alkoxy-(C₁-C₄)-alkyl, hydroxy-(C₁-C₄)-alkyl, (C₀-C₂)-alkylene-
 aryl, oxo, CO(R₂₆), CON(R₂₇)(R₂₈), hydroxy, N(R₃₁)(R₃₂)
 15 or SO₂CH₃; where R¹ and R² are not both CO(R₂₆),
 preferably H, (C₁-C₈)-alkyl, -(CR₇₈R₇₉)_o-R12, (C₁-C₄)-
 alkoxy-(C₁-C₄)-alkyl, or R1 and R2 form together with the
 nitrogen atom to which they are bonded a 4 to 10-membered
 20 mono- or bicyclic ring which, apart from the nitrogen atom,
 may comprise 0 to 2 additional heteroatoms selected from the
 group of oxygen and nitrogen, where the heterocyclic ring
 system may additionally be substituted by F, (C₁-C₆)-alkyl,
 (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, oxo, CO(R₂₆), hydroxy,
 25 N(R₃₁)(R₃₂);
- o 0, 1, 2, 3, 4, preferably
 0, 1, 2, 3;
- 30 q 1, 2, 3, preferably
 1 or 2;

s 0, 1, 2;

R15, R16, R17, R18, R23, R24, R25, R26, R27, R28, R31, R32

5 independently of one another H, (C₁-C₆)-alkyl;

or

R17 and R18, R27 and R28, R31 and R32

10 independently of one another optionally together with the nitrogen atom to which they are bonded a 5-6 membered ring which, apart from the nitrogen atom, may also comprise 0-1 further heteroatoms from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur, preferably the ring is a pyrrolidine, piperidine, N-methylpiperazine, morpholine ring;

15 R12 OH, O-(C₁-C₆)-alkyl, O-(C₀-C₂)-alkylene-aryl, CN, S-(C₁-C₆)-alkyl, 3-12 membered mono-, bi- or spirocyclic ring which may comprise 1 to 3 heteroatoms from the group of N, O and S, and the 3-12 membered ring may comprise further substituents such as F, OH, CF₃, CN, oxo, (C₁-C₆)-alkyl, (C₀-
20 C₂)-alkylene-aryl, N(R34)(R35), COO(R40), CO(C₁-C₆)-alkyl, preferably OH, O-(C₁-C₆)-alkyl, 3-10 membered mono- or bicyclic ring which may comprise 1-2 heteroatoms from the group of N, O and S, and the 3-10 membered ring may comprise further substituents such as F, OH, oxo, (C₁-C₆)-
25 alkyl, CO(C₁-C₆)-alkyl;



R34, R35

independently of one another H, (C₁-C₄)-alkyl;

R40 H, (C₁-C₆)-alkyl, (C₀-C₂)-alkylene-aryl;

- R78, R79 independently of one another H, (C₁-C₈)-alkyl, hydroxy-(C₁-C₄)-alkyl, OH, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl;
- 5 R42, R42' independently of one another H, F, Cl, Br, CF₃, CN, (C₁-C₆)-alkyl;
- R10 H, (C₁-C₈)-alkyl;
- 10 X N(R52), a bond, C=C, C(R53)(R54), CH₂CH₂;
- R52, R53, R54 independently of one another H, (C₁-C₈)-alkyl;
- 15 E 5-7 membered bivalent carbo- or heterocyclic ring structure with 0-3 heteroatoms from the group of N, O and S, which may optionally have substituents from the group of H, F, Cl, Br, CF₃, OH, CN, OCF₃, NO₂, O-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, SO₂-CH₃, CO(R65);
- 20 preferably 5-7 membered bivalent carbo- or heterocyclic ring structure with 0-2 heteroatoms from the group of N, O and S, which may optionally have substituents from the group of H, F, Cl, Br, OH, CF₃, NO₂, OCF₃, O-(C₁-C₆)-alkyl, (C₁-C₆)-
- 25 alkyl, (C₂-C₆)-alkenyl, N(R57)(R58), SO₂-CH₃, CO(R65)
e.g. E is selected from the group consisting of

5 CF₃, NO₂, OCF₃, O-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl,
N(R57)(R58), SO₂-CH₃, CO(R65);

R65 H, (C₁-C₈)-alkyl;

K a bond, O, OCH₂, CH₂O, S, SO₂, N(R66), N(R67)CO,

CON(R68), (C(R69)(R70))_v, CO, C≡C, SCH₂, SO₂CH₂;

preferably a bond, O, OCH₂, CH₂O, CON(R68),

(C(R69)(R70))_v, particularly preferably CH₂, CO, C≡C;

5 v 1, 2, 3, preferably
 1, 2;

R66, R67, R68, R69, R70

independently of one another H, (C₁-C₈)-alkyl;

10

R11 (C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, a 3 to 10-
 membered mono-, bi-, tri- or spirocyclic ring which may
 comprise 0 to 4 heteroatoms selected from the group of
 oxygen, nitrogen and sulfur, where the ring system may
15 additionally be substituted by F, Cl, Br, CF₃, CN, (C₁-C₆)-
 alkyl, O-(C₁-C₈)-alkyl, oxo, CO(R71), hydroxy,
 N(R75)CO(C₁-C₆)-alkyl, or SO₂CH₃;

 preferably (C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, a 3 to
 10-membered mono- or bicyclic ring which may comprise 0 to
20 2 heteroatoms selected from the group of oxygen, nitrogen
 and sulfur, where the ring system may additionally be
 substituted by F, Cl, Br, CF₃, CN, (C₁-C₆)-alkyl, O-(C₁-C₈)-
 alkyl, oxo, CO(R71), CON(R72)(R73), N(R75)CO(C₁-C₆)-
 alkyl, or SO₂CH₃;

25

R71, R72, R73, R74, R75, R76, R77

independently of one another H, (C₁-C₈)-alkyl;

or

R72 and R73, R76 and R77

independently of one another optionally together with the nitrogen atom to which they are bonded a 5-6 membered ring which, apart from the nitrogen atom, may also comprise 0-1 further heteroatoms from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur.

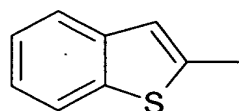
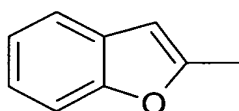
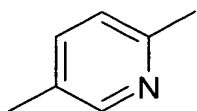
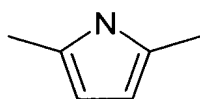
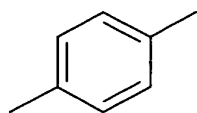
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In a preferred embodiment, the present invention relates to compounds of the formula Ia,

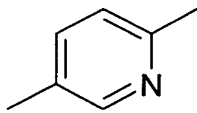
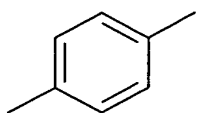
10 in which

X is CH₂CH₂, N(R₅₂), CH₂, OCH₂, SCH₂, CH=CH, preferably CH₂CH₂, CH=CH;

E is



, preferably



15

K is a bond, O or C(R₆₉)(R₇₀);

20 and the other symbols R₁, R₂, R₁₀, R₁₁, R₄₂, R_{42'}, R₅₂, R₆₉ and R₇₀ have the meanings indicated above in relation to a definition of the radicals of the compound of the formula Ia.

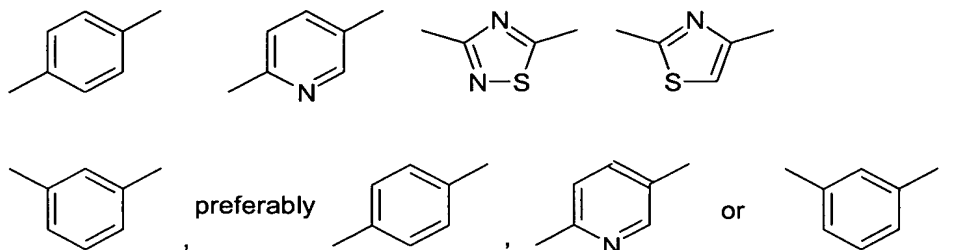
In a further preferred embodiment, the present invention relates to compounds of the formula Ia,

in which

5

X is N(R52), preferably NH, or C(R53)(R54);

E is



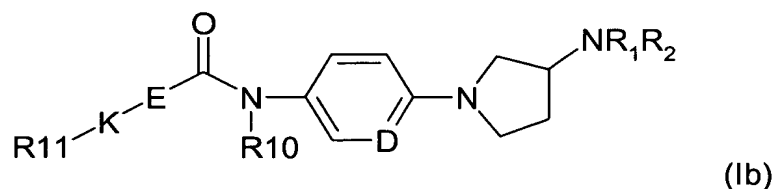
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K is a bond, O or C(R69)(R70), preferably O;
preferably O

and the other symbols R1, R2, R10, R11, R42, R42', R52, R53, R54, R69
15 and R70 have the meanings indicated above in relation to a definition of the radicals of the compound of the formula Ia.

In a further particularly preferred embodiment, the compounds of the
formula I are compounds of the formula Ib

20



in which the radicals R1, R2, R10 and R11 and the groups E and D have
the aforementioned meanings, or the N-oxides and the physiologically
25 tolerated salts thereof.

In a preferred embodiment, the radicals R1, R2, R10 and R11 the groups E and D have the following meanings:

- R1, R2 independently of one another H, (C₁-C₈)-alkyl, -(CR₇₈R₇₉)_o
- 5 -R₁₂, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, (C₃-C₈)-alkenyl, CO-(C₁-C₈)-alkyl, -CO-(CH₂)_o -R₁₂, CO-aryloxy-(C₁-C₄)-alkyl, COCH=CH(R₁₃), COCC(R₁₄), CO(C(R₁₅)(R₁₆))_qN(R₁₇)(R₁₈), CO(C(R₁₉)(R₂₀))_rCON(R₂₁)(R₂₂),
- 10 CO(C(R₂₃)(R₂₄))_sO(R₂₅); or R1 and R2 form together with the nitrogen atom to which they are bonded a 4 to 10-membered mono-, bi- or spirocyclic ring which, apart from the nitrogen atom, may comprise 0 to 2 additional heteroatoms selected from the group of oxygen, nitrogen and sulfur, where
- 15 the heterocyclic ring system may additionally be substituted by F, Cl, CF₃, (C₁-C₆)-alkyl, O-(C₁-C₄)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, hydroxy-(C₁-C₄)-alkyl, (C₀-C₂)-alkylene-aryl, oxo, CO(R₂₆), CON(R₂₇)(R₂₈), hydroxy, COO(R₂₉), N(R₃₀)CO(C₁-C₆)-alkyl, N(R₃₁)(R₃₂) or SO₂CH₃, where R1 and R2 are not both CO(R₂₆);
- 20 preferably independently of one another H, (C₁-C₈)-alkyl, -(CR₇₈R₇₉)_o -R₁₂, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, CO-(C₁-C₈)-alkyl, -CO-(CH₂)_o -R₁₂, COCH=CH(R₁₃), COCC(R₁₄), CO(C(R₁₅)(R₁₆))_qN(R₁₇)(R₁₈), CO(C(R₂₃)(R₂₄))_sO(R₂₅);
- 25 or R1 and R2 form together with the nitrogen atom to which they are bonded a 4 to 10-membered mono- or bicyclic ring which, apart from the nitrogen atom, may comprise 0 to 2 additional heteroatoms selected from the group of oxygen, nitrogen and sulfur, where the heterocyclic ring system may

additionally be substituted by F, Cl, CF₃, (C₁-C₆)-alkyl, O-(C₁-C₄)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, (C₀-C₂)-alkylene-aryl, oxo, hydroxy, N(R₃₁)(R₃₂) or SO₂CH₃, where R₁ and R₂ are not both CO-(C₁-C₈)-alkyl;

5 particularly preferably independently of one another H, (C₁-C₈)-alkyl, -(CR₇₈R₇₉)_o-R₁₂, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, CO-(C₁-C₈)-alkyl, -CO-(CH₂)_o-R₁₂, CO(C(R₁₅)(R₁₆))_qN(R₁₇)(R₁₈), or R₁ and R₂ form together

10 with the nitrogen atom to which they are bonded a 4 to 10-membered mono- or bicyclic ring which, apart from the nitrogen atom, may comprise 0 to 2 additional heteroatoms selected from the group of oxygen and nitrogen, where the heterocyclic ring system may additionally be substituted by F, (C₁-C₆)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, oxo, CO(C₁-C₈)-alkyl, hydroxy, N(R₃₁)(R₃₂), where R₁ and R₂ are not both

15 CO(C₁-C₈)-alkyl;

o 0, 1, 2, 3, 4, 5, 6; preferably 0, 1, 2, 3, 4; particularly preferably 0, 1, 2, 3;

20 q, r independently of one another 1, 2, 3; preferably q is 1 or 2;

s 0, 1, 2, 3, 4; preferably 0, 1, 2, 3; particularly preferably 0, 1, 2;

25 R₁₃, R₁₄ independently of one another a phenyl ring which may comprise 0-1 nitrogen atoms;

30 R₁₅, R₁₆, R₁₇, R₁₉, R₂₀, R₂₁, R₂₂, R₂₃, R₂₄, R₂₅, R₂₆, R₂₇, R₂₈, R₂₉, R₃₀, R₃₁, R₃₂ independently of one another H, (C₁-C₆)-alkyl;

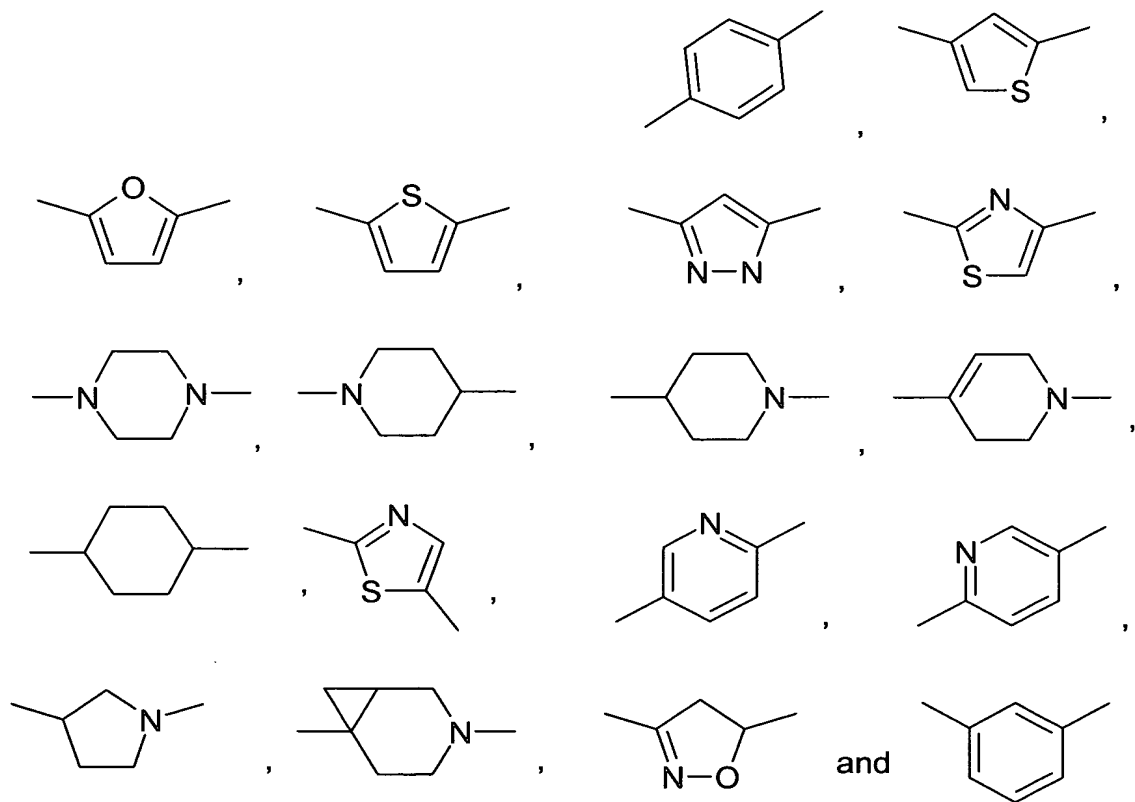
- R18 H, (C₁-C₆)-alkyl, CO(C₁-C₆)-alkyl, CO(R33); preferably H, (C₁-C₆)-alkyl, CO(C₁-C₆)-alkyl; particularly preferably H, (C₁-C₆)-alkyl;
- 5 or
- R17 and R18, R21 and R22, R27 and R28, R31 and R32 independently of one another optionally together with the nitrogen atom to which they are bonded a 5-6 membered ring which, apart from the nitrogen atom, may also comprise 0-1
- 10 further heteroatoms from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur; preferably the ring is pyrrolidine, piperidine, N-methylpiperazine, morpholine;
- R33 a 5-10 membered aromatic ring system which may comprise
- 15 a further heteroatom from the group of nitrogen, oxygen and sulfur and may be substituted by F, Cl, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl;
- R12 is OH, O-(C₁-C₆)-alkyl, O-(C₀-C₈)-alkylene-aryl, CN, S-
- 20 (C₁-C₆)-alkyl, COO(R80), CON(R81)(R82), 3-12 membered mono-, bi- or spirocyclic ring which may comprise one or more heteroatoms from the group of N, O and S and the 3-12 membered ring may comprise further substituents such as F, Cl, Br, OH, CF₃, CN, oxo, O-(C₁-C₆)-alkyl, (C₁-C₄)-alkoxy-
- 25 (C₁-C₄)-alkyl, (C₁-C₆)-alkyl, O-(C₀-C₈)-alkylene-aryl, (C₀-C₈)-alkylene-aryl, N(R34)(R35), COCH=CH(R36), (C(R37)(R38))_t (R39), CO(C(R37)(R38))_t (R39), CO(C₁-C₆)-alkyl, COCOO(C₁-C₆)-alkyl, COO(R40), S(O)_u (R41); preferably OH, O-(C₁-C₆)-alkyl, O-(C₀-C₈)-alkylene-aryl, CN,

- 3-10 membered mono- or bicyclic ring which may comprise 1-3 heteroatoms from the group of N, O and S, and the 3-10 membered ring may comprise further substituents such as F, Cl, Br, OH, CF₃, CN, oxo, O-(C₁-C₆)-alkyl, (C₁-C₄)-alkoxy-
- 5 (C₁-C₄)-alkyl, (C₁-C₆)-alkyl, (C₀-C₂)-alkylene-aryl, N(R₃₄)(R₃₅), CO(C₁-C₆)-alkyl; particularly preferably OH, O-(C₁-C₆)-alkyl, 3-10 membered mono- or bicyclic ring which may comprise 1-2 heteroatoms from the group of N, O and S and the 3-10 membered ring
- 10 may comprise further substituents such as F, OH, oxo, (C₁-C₆)-alkyl, CO(C₁-C₆)-alkyl;
- t 0, 1, 2, 3, 4, 5, 6;
- 15 u 0, 1, 2; preferably 0 or 2; particularly preferably 2;
- R₃₄, R₃₅, R₃₇, R₃₈
- independently of one another H, (C₁-C₈)-alkyl;
- or
R₃₄ and R₃₅
- 20 optionally together with the nitrogen atom to which they are bonded a 5-6 membered ring which, apart from the nitrogen atom, may also comprise 0-1 further heteroatoms from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur and may optionally be substituted by 1-2 oxo groups;
- 25 R₃₆, R₃₉ independently of one another (C₃-C₈)-cycloalkyl, 5-10 membered aromatic ring system which may comprise 0-2 further heteroatoms from the group of nitrogen, oxygen and sulfur and may be substituted by F, Cl, (C₁-C₆)-alkyl, O-
- 30 (C₁-C₈)-alkyl;

- R40 H, (C₁-C₈)-alkyl, (C₂-C₆)-alkenyl, (C₀-C₈)-alkylene-aryl;
- 5 R41 (C₁-C₆)-alkyl, 5-10 membered aromatic ring system which may comprise 0-2 further heteroatoms from the group of nitrogen, oxygen and sulfur and may be substituted by F, Cl, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl;
- 10 R78, R79 independently of one another H, (C₁-C₈)-alkyl, hydroxy-(C₁-C₄)-alkyl, OH, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl;
- R80, R81 independently of one another H, (C₁-C₈)-alkyl;
- 15 R10 H, (C₁-C₈)-alkyl;
- E 3-8 membered bivalent carbo- or heterocyclic ring structure with 0-4 heteroatoms from the group of N, O and S, which may optionally have substituents from the group of H, F, Cl, Br, OH, CF₃, NO₂, CN, OCF₃, O-(C₁-C₆)-alkyl, O-(C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, S-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl, O-(C₃-C₈)-cycloalkyl, (C₃-C₈)-cycloalkenyl, (C₂-C₆)-alkynyl, (C₀-C₈)-alkylene-aryl, O-(C₀-C₈)-alkylene-aryl, S-aryl, N(R57)(R58), SO₂-CH₃, N(R61)CO(R62), N(R63)SO₂(R64), CO(R65) and may be mono- or bicyclic;
- 20
- 25 preferably 5-7 membered bivalent carbo- or heterocyclic ring structure with 0-3 heteroatoms from the group of N, O and S, which may optionally have substituents from the group of H, F, Cl, Br, OH, CF₃, NO₂, CN, OCF₃, O-(C₁-C₆)-alkyl, S-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl, O-(C₀-C₈)-alkylene-

aryl, S-aryl, N(R57)(R58), SO₂-CH₃, N(R61)CO(R62),
 CO(R65) and may be mono- or bicyclic;
 particularly preferably 5-7 membered bivalent carbo- or
 heterocyclic ring structure with 0-2 heteroatoms from the
 group of N, O and S, which may optionally have substituents
 from the group of H, F, Cl, Br, OH, CF₃, NO₂, OCF₃, O-(C₁-
 C₆)-alkyl, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl, N(R57)(R58),
 SO₂-CH₃, CO(R65)
 e.g. E is selected from the group consisting of

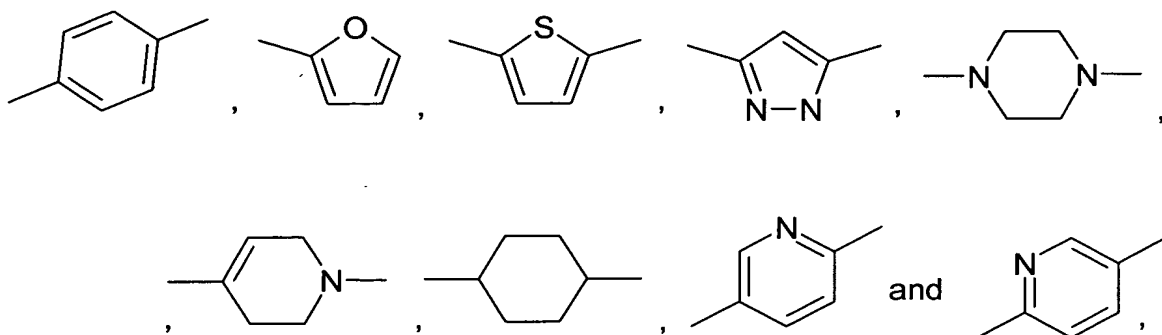
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which may optionally have substituents from the group of H, F, Cl, Br, OH,
 CF₃, NO₂, OCF₃, O-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl,
 N(R57)(R58), SO₂-CH₃, CO(R65);

15

preferably



5 which may optionally have the aforementioned substituents;

R57, R58, R61, R63

independently of one another H, (C₁-C₈)-alkyl;

10 R62, R64, R65

independently of one another H, (C₁-C₈)-alkyl, aryl; preferably

independently of one another H, (C₁-C₈)-alkyl;

K a bond, O, OCH₂, CH₂O, S, SO, SO₂, N(R66), N(R67)CO,

15 CON(R68), (C(R69)(R70))_v, CO, C=C, C≡C, SCH₂, SO₂CH₂;

preferably a bond, O, OCH₂, CH₂O, N(R66), CON(R68),

(C(R69)(R70))_v, CO, C≡C, SCH₂; particularly preferably a

bond, O, OCH₂, CH₂O, CON(R68), (C(R69)(R70))_v, CO,

C≡C;

20

v 1, 2, 3, 4; preferably 1, 2, 3; particularly preferably 1,2;

R66, R67, R68, R69, R70

independently of one another H, (C₁-C₈)-alkyl;

25

- R11 H, (C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, (C₃-C₈)-alkenyl, (C₃-C₈)-alkynyl, a 3 to 10-membered mono-, bi-, tri- or spirocyclic ring which may comprise 0 to 4 heteroatoms selected from the group of oxygen, nitrogen and sulfur, where the ring system may additionally be substituted by F, Cl, Br, CF₃, CN, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, hydroxy-(C₁-C₄)-alkyl, (C₀-C₈)-alkylene-aryl, oxo, CO(R71), CON(R72)(R73), hydroxy, COO(R74), N(R75)CO(C₁-C₆)-alkyl, N(R76)(R77) or SO₂CH₃ SCF₃;
- 5 preferably (C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, a 3 to 10-membered mono-, bi-, tri- or spirocyclic ring which may comprise 0 to 3 heteroatoms selected from the group of oxygen, nitrogen and sulfur, where the ring system may additionally be substituted by F, Cl, Br, CF₃, CN, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl, (C₀-C₂)-alkylene-aryl, oxo, CO(R71), CON(R72)(R73), hydroxy, N(R75)CO(C₁-C₆)-alkyl, N(R76)(R77) or SO₂CH₃;
- 10 particularly preferably (C₁-C₈)-alkyl, (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl, a 3 to 10-membered mono- or bicyclic ring which may comprise 0 to 2 heteroatoms selected from the group of oxygen, nitrogen and sulfur, where the ring system may additionally be substituted by F, Cl, Br, CF₃, CN, (C₁-C₆)-alkyl, O-(C₁-C₈)-alkyl, oxo, CO(R71), CON(R72)(R73), N(R75)CO(C₁-C₆)-alkyl, or SO₂CH₃;
- 15
- 20
- 25
- R71, R72, R73, R74, R75, R76, R77
- independently of one another H, (C₁-C₈)-alkyl;
- or
- R72 and R73, R76 and R77

independently of one another optionally together with the nitrogen atom to which they are bonded a 5-6 membered ring which, apart from the nitrogen atom, may also comprise 0-1 further heteroatoms from the group of N-(C₁-C₆)-alkyl, oxygen and sulfur.

5

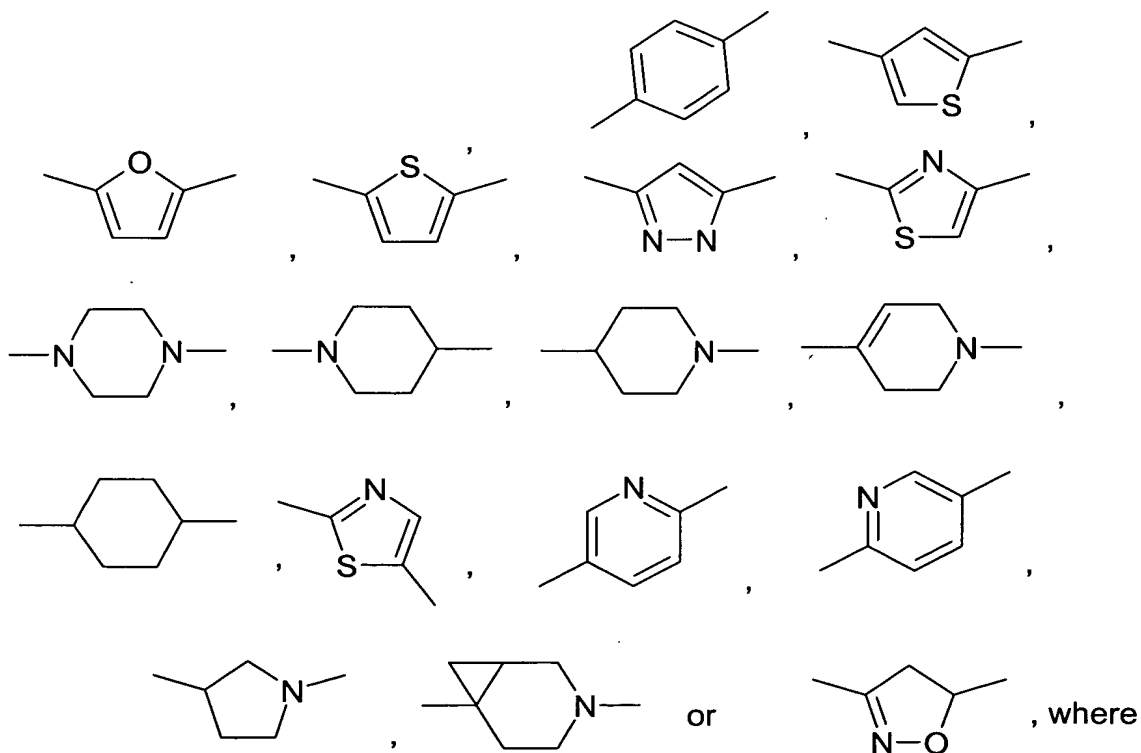
In a preferred embodiment, the present invention relates to compounds of the formula Ib

in which

10

X is a bond,

E is

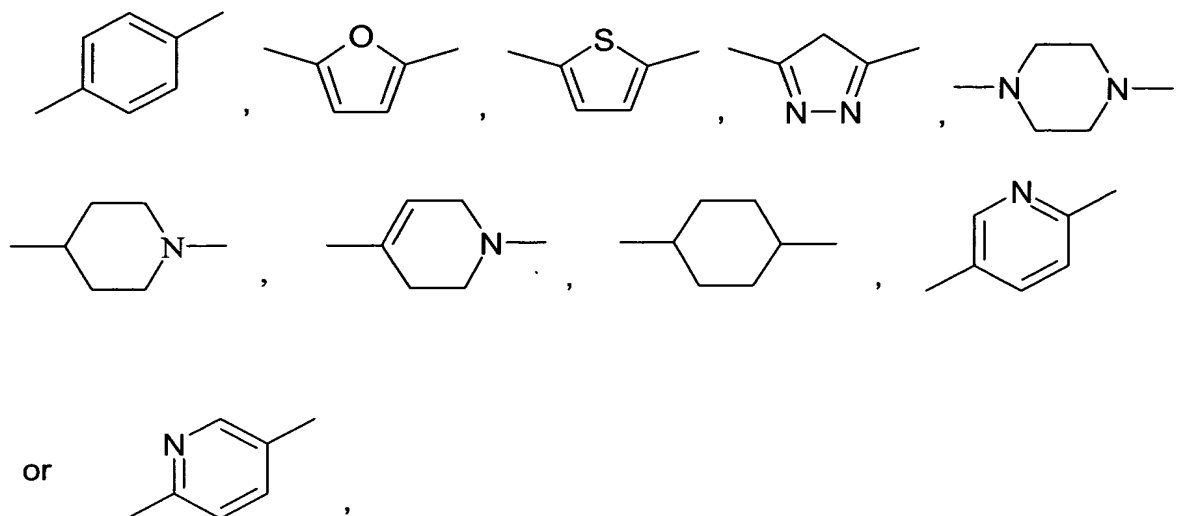


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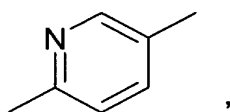
the aforementioned groups may optionally have substituents from the group of H, F, Cl, Br, OH, CF₃, NO₂, OCF₃, O-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl, N(R₅₇)(R₅₈), SO₂-CH₃, CO(R₆₅);

20

preferably E is



or



in which the groups may have the aforementioned substituents;

K is a bond; and

the other radicals R1, R2, R10 and R11 and the group D have the meanings indicated above in relation to the definition of the radicals of the compound of the formula Ib.

R11 in the aforementioned compounds of the formula Ib is particularly preferably a substituted mono- or bicyclic ring system with 5-10 members, which may have 0-3 heteroatoms, in particular N, O and/or S, particularly preferably phenyl with 0-1 N atom, cyclohexyl or a bicyclic system with 8-10 members and 1-2 heteroatoms, in particular N, O and/or S.

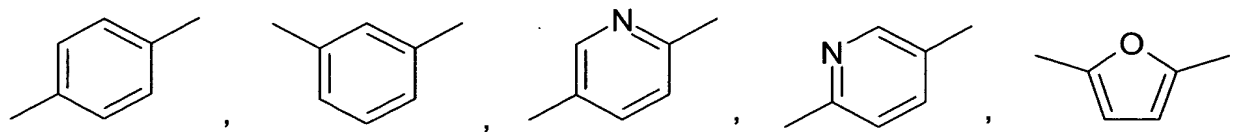
In a further preferred embodiment, the present invention relates to compounds of the formula Ib

in which

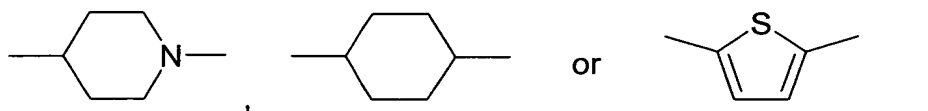
X is a bond;

E

is



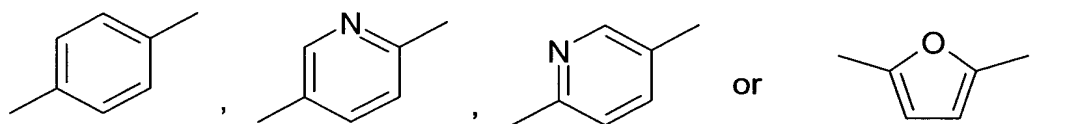
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where the aforementioned groups may optionally have substituents from the group of H, F, Cl, Br, OH, CF₃, NO₂, OCF₃, O-(C₁-C₆)-alkyl, (C₁-C₆)-alkyl, (C₂-C₆)-alkenyl, N(R₅₇)(R₅₈), SO₂CH₃ and CO(R₆₅);

10

preferably



15 in which the groups may have the aforementioned substituents;

K is CH₂, CH₂CH₂, O, CH₂O, OCH₂, CON(R₆₈), N(R₆₇)CO, S, SO₂, SCH₂, SO₂, SO₂CH₂, CO or a triple bond;

preferably CH₂, O, CH₂O, OCH₂, CON(R₆₈), SCH₂, CO or a triple

20

bond; and

the other radicals R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, R₉, R₁₀, R₁₁, R₆₇ and R₆₈ and the group D have the meanings indicated above in relation to the definition of the radicals of the compound of the formula Ib.

The amount of a compound of formula (I) necessary to achieve the desired biological effect depends on a number of factors, for example the specific compound chosen, the intended use, the mode of administration and the clinical condition of the patient. The daily dose is generally in the range from 0.3 mg to 100 mg (typically from 3 mg to 50 mg) per day and per kilogram of bodyweight, for example 3-10 mg/kg/day. An intravenous dose may be, for example, in the range from 0.3 mg to 1.0 mg/kg, which can suitably be administered as infusion of 10 ng to 100 ng per kilogram and per minute. Suitable infusion solutions for these purposes may contain, for example, from 0.1 ng to 10 mg, typically from 1 ng to 10 mg, per milliliter. Single doses may contain, for example, from 1 mg to 10 g of the active ingredient. Thus, ampoules for injections may contain, for example, from 1 mg to 100 mg, and single-dose formulations which can be administered orally, such as, for example, tablets or capsules, may contain, for example, from 1.0 to 1000 mg, typically from 10 to 600 mg. In the case of pharmaceutically acceptable salts, the aforementioned weight data are based on the weight of the free compound from which the salt is derived. For the prophylaxis and therapy of the abovementioned conditions, the compounds of formula (I) may be used as the compound itself, but they are preferably in the form of a pharmaceutical composition with an acceptable carrier. The carrier must, of course, be acceptable in the sense that it is compatible with the other ingredients of the composition and is not harmful for the patient's health. The carrier may be a solid or a liquid or both and is preferably formulated with the compound as a single dose, for example as a tablet, which may contain from 0.05% to 95% by weight of the active ingredient. Other pharmaceutically active substances may likewise be present, including other compounds of formula (I). The pharmaceutical compositions of the invention can be produced by one of the known pharmaceutical methods, which essentially consist of mixing the ingredients with pharmacologically acceptable carriers and/or excipients.

Pharmaceutical compositions of the invention are those suitable for oral, rectal, topical, peroral (for example sublingual) and parenteral (for example subcutaneous, intramuscular, intradermal or intravenous) administration, although the most suitable mode of administration depends in each individual case on the nature and severity of the condition to be treated and on the nature of the compound of formula (I) used in each case. Coated formulations and coated slow-release formulations also belong within the

framework of the invention. Preference is given to acid- and gastric juice-resistant formulations. Suitable coatings resistant to gastric juice comprise cellulose acetate phthalate, polyvinyl acetate phthalate, hydroxypropylmethylcellulose phthalate and anionic polymers of methacrylic acid and methyl methacrylate.

Suitable pharmaceutical compounds for oral administration may be in the form of separate units such as, for example, capsules, cachets, suckable tablets or tablets, each of which contain a defined amount of the compound of formula (I); as powders or granules; as solution or suspension in an aqueous or nonaqueous liquid; or as an oil-in-water or water-in-oil emulsion. These compositions may, as already mentioned, be prepared by any suitable pharmaceutical method which includes a step in which the active ingredient and the carrier (which may consist of one or more additional ingredients) are brought into contact. The compositions are generally produced by uniform and homogeneous mixing of the active ingredient with a liquid and/or finely divided solid carrier, after which the product is shaped if necessary. Thus, for example, a tablet can be produced by compressing or molding a powder or granules of the compound, where appropriate with one or more additional ingredients. Compressed tablets can be produced by tableting the compound in free-flowing form such as, for example, a powder or granules, where appropriate mixed with a binder, glidant, inert diluent and/or one or more surface-active/dispersing agent(s) in a suitable machine. Molded tablets can be produced by molding the compound, which is in powder form and is moistened with an inert liquid diluent, in a suitable machine.

Pharmaceutical compositions which are suitable for peroral (sublingual) administration comprise suckable tablets which contain a compound of formula (I) with a flavoring, normally sucrose and gum arabic or tragacanth, and pastilles which comprise the compound in an inert base such as gelatin and glycerol or sucrose and gum arabic.

Pharmaceutical compositions suitable for parenteral administration comprise preferably sterile aqueous preparations of a compound of formula (I), which are preferably isotonic with the blood of the intended recipient. These preparations are preferably administered intravenously, although administration may also take place by subcutaneous, intramuscular or intradermal injection. These preparations can preferably

be produced by mixing the compound with water and making the resulting solution sterile and isotonic with blood. Injectable compositions of the invention generally contain from 0.1 to 5% by weight of the active compound.

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Pharmaceutical compositions suitable for rectal administration are preferably in the form of single-dose suppositories. These can be produced by mixing a compound of the formula (I) with one or more conventional solid carriers, for example cocoa butter, and shaping the resulting mixture.

10

Pharmaceutical compositions suitable for topical use on the skin are preferably in the form of ointment, cream, lotion, paste, spray, aerosol or oil. Carriers which can be used are petrolatum, lanolin, polyethylene glycols, alcohols and combinations of two or more of these substances.

15

The active ingredient is generally present in a concentration of from 0.1 to 15% by weight of the composition, for example from 0.5 to 2%.

Transdermal administration is also possible. Pharmaceutical compositions suitable for transdermal uses can be in the form of single plasters which are suitable for long-term close contact with the patient's epidermis. Such plasters suitably contain the active ingredient in an aqueous solution which is buffered where appropriate, dissolved and/or dispersed in an adhesive or dispersed in a polymer. A suitable active ingredient concentration is about 1% to 35%, preferably about 3% to 15%. A particular possibility is for the active ingredient to be released by electrotransport or iontophoresis as described, for example, in *Pharmaceutical Research*, 2(6): 318 (1986).

25

As used herein, the following definitions apply:

30

"Patient" means a warm blooded animal, such as for example rat, mice, dogs, cats, guinea pigs, and primates such as humans.

"Treat" or "treating" means to alleviate symptoms, eliminate the causation of the symptoms either on a temporary or permanent basis, or to prevent or slow the appearance of symptoms of the named disorder or condition.

35

"Therapeutically effective amount" means a quantity of the compound which is effective in treating the named disorder or condition.

“Pharmaceutically acceptable carrier” is a non-toxic solvent, dispersant, excipient, adjuvant or other material which is mixed with the active ingredient in order to permit the formation of a pharmaceutical composition, i.e., a dosage form capable of administration to the patient. One example of such a carrier is a pharmaceutically acceptable oil typically used for parenteral administration.

The compounds of the formula I are distinguished by beneficial effects on lipid metabolism, and they are particularly suitable for weight reduction and for maintaining a reduced weight after weight reduction has taken place in mammals and as anorectic agents. The compounds are distinguished by their low toxicity and their few side effects. The compounds can be employed alone or in combination with other weight-reducing or anorectic active ingredients. Further anorectic active ingredients of this type are mentioned, for example, in the Rote Liste, chapter 01 under weight-reducing agents/appetite suppressants, and they also include active ingredients which increase the energy turnover of the organism and thus lead to weight reduction or else those which influence the general metabolism of the organism in such a way that an increased calorie intake does not lead to an enlargement of the fat depots and a normal calorie intake leads to a reduction of the fat depots of the organism. The compounds are suitable for the prophylaxis and, in particular, for the treatment of excessive weight or obesity. The compounds are further suitable for the prophylaxis and, in particular, for the treatment of type II diabetes, of arteriosclerosis and for normalizing lipid metabolism and for the treatment of high blood pressure. The compounds act as MCH antagonists and are also suitable for the treatment of disturbances of wellbeing and of psychiatric indications such as, for example, depressions, anxiety states, anxiety neuroses, schizophrenia and for the treatment of disorders associated with the circadian rhythm and for the treatment of drug abuse.

In a further aspect of the invention, the compounds of the formula I can be administered in combination with one or more other pharmacologically active substances which are selected, for example, from antidiabetics, antiobesity agents, active ingredients which lower blood pressure, lipid-

lowering agents and active ingredients for the treatment and/or prevention of complications caused by diabetes or associated with diabetes.

Further pharmacologically active substances suitable in particular are:

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all antidiabetics mentioned in the Rote Liste 2001, chapter 12. They may be combined with the compounds of the formula I of the invention in particular for a synergistic improvement of the effect. Administration of the active ingredient combination may take place either by separate administration of the active ingredients to the patient or in the form of combination products in which a plurality of active ingredients are present in one pharmaceutical preparation. Most of the active ingredients listed below are disclosed in the USP Dictionary of USAN and International Drug Names, US Pharmacopeia, Rockville 2001.

15

Suitable antidiabetics include insulin and insulin derivatives such as, for example, Lantus® or HMR 1964, fast-acting insulins (see US 6,221,633), amylin, GLP-1 and GLP-2 derivatives such as, for example, those disclosed in WO 98/08871 of Novo Nordisk A/S, and orally effective hypoglycemic active ingredients.

20

The orally effective hypoglycemic active ingredients include, preferably, sulfonylureas, biguanidines, meglitinides, oxadiazolidinediones, thiazolidinediones, glucosidase inhibitors, glucagon receptor antagonists, GLP-1 agonists, potassium channel openers such as, for example, those disclosed in WO 97/26265 and WO 99/03861 of Novo Nordisk A/S, insulin sensitizers, activators of insulin receptor kinase, inhibitors of liver enzymes involved in the stimulation of gluconeogenesis and/or glycogenolysis, for example inhibitors of glycogen phosphorylase, modulators of glucose uptake and glucose excretion, compounds which alter lipid metabolism, such as antihyperlipidemic active ingredients and antilipidemic active ingredients, e.g. HMGCoA reductase inhibitors, inhibitors of cholesterol transport/of cholesterol uptake, inhibitors of bile acid reabsorption or inhibitors of microsomal triglyceride transfer protein (MTP), compounds which reduce food intake, PPAR and RXR agonists and active ingredients which act on the ATP-dependent potassium channel of the beta cells.

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In one embodiment of the invention, the present compounds are administered in combination with insulin.

In one embodiment of the invention, the compounds of the formula I are administered in combination with an HMGCoA reductase inhibitor such as simvastatin, fluvastatin, pravastatin, lovastatin, atorvastatin, cerivastatin,
5 rosuvastatin.

In one embodiment of the invention, the compounds of the formula I are administered in combination with a cholesterol absorption inhibitor such as, for example, ezetimibe, tiqueside, pamaqueside.
10

In one embodiment of the invention, the compounds of the formula I are administered in combination with a PPAR gamma agonist, such as, for example, rosiglitazone, pioglitazone, JTT-501, GI 262570.

15 In one embodiment of the invention, the compounds of the formula I are administered in combination with PPAR alpha agonist, such as, for example, GW 9578, GW 7647.

20 In one embodiment of the invention, the compounds of the formula I are administered in combination with a mixed PPAR alpha/gamma agonist, such as, for example, GW 1536, AVE 8042, AVE 8134, AVE 0847, or as described in PCT/US 11833, PCT/US 11490, DE10142734.4.

25 In one embodiment of the invention, the compounds of the formula I are administered in combination with a fibrate such as, for example, fenofibrate, clofibrate, bezafibrate.

30 In one embodiment of the invention, the compounds of the formula I are administered in combination with an MTP inhibitor such as, for example, implitapide, BMS-201038, R-103757.

In one embodiment of the invention, the compounds of the formula I are administered in combination with bile acid absorption inhibitor (see, for example, US 6,245,744 or US 6,221,897), such as, for example, HMR
35 1741.

In one embodiment of the invention, the compounds of the formula I are administered in combination with a CETP inhibitor, such as, for example, JTT-705.

In one embodiment of the invention, the compounds of the formula I are administered in combination with a polymeric bile acid adsorbent such as, for example, cholestyramine, colestevlam.

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In one embodiment of the invention, the compounds of the formula I are administered in combination with an LDL receptor inducer (see US 6,342,512), such as, for example, HMR1171, HMR1586.

10 In one embodiment of the invention, the compounds of the formula I are administered in combination with an ACAT inhibitor, such as, for example, avasimibe.

15 In one embodiment of the invention, the compounds of the formula I are administered in combination with an antioxidant, such as, for example, OPC-14117.

20 In one embodiment of the invention, the compounds of the formula I are administered in combination with a lipoprotein lipase inhibitor, such as, for example, NO-1886.

In one embodiment of the invention, the compounds of the formula I are administered in combination with an ATP-citrate lyase inhibitor, such as, for example, SB-204990.

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In one embodiment of the invention, the compounds of the formula I are administered in combination with a squalene synthetase inhibitor, such as, for example, BMS-188494.

30 In one embodiment of the invention, the compounds of the formula I are administered in combination with a lipoprotein(a) antagonist, such as, for example, CI-1027 or nicotinic acid.

35 In one embodiment of the invention, the compounds of the formula I are administered in combination with a lipase inhibitor, such as, for example, orlistat.

In one embodiment of the invention, the compounds of the formula I are administered in combination with insulin.

In one embodiment, the compounds of the formula I are administered in combination with a sulfonylurea such as, for example, tolbutamide, glibenclamide, glipizide or glimepiride.

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In one embodiment, the compounds of the formula I are administered in combination with a biguanide, such as, for example, metformin.

10 In one further embodiment, the compounds of the formula I are administered in combination with a meglitinide, such as, for example, repaglinide.

15 In one embodiment, the compounds of the formula I are administered in combination with a thiazolidinedione, such as, for example, troglitazone, ciglitazone, pioglitazone, rosiglitazone or the compounds disclosed in WO 97/41097 of Dr. Reddy's Research Foundation, in particular 5-[[4-[(3,4-dihydro-3-methyl-4-oxo-2-quinazolinylmethoxy)phenyl]methyl]-2,4-thiazolidinedione.

20 In one embodiment, the compounds of the formula I are administered in combination with an α -glucosidase inhibitor, such as, for example, miglitol or acarbose.

25 In one embodiment, the compounds of the formula I are administered in combination with an active ingredient which acts on the ATP-dependent potassium channel of the beta cells, such as, for example, tolbutamide, glibenclamide, glipizide, glimepiride or repaglinide.

30 In one embodiment, the compounds of the formula I are administered in combination with more than one of the aforementioned compounds, e.g. in combination with a sulfonylurea and metformin, with a sulfonylurea and acarbose, repaglinide and metformin, insulin and a sulfonylurea, insulin and metformin, insulin and troglitazone, insulin and lovastatin, etc. The compounds of the invention may moreover be administered in combination
35 with one or more antiobesity agents or appetite-controlling active ingredients.

In a further embodiment, the compounds of the formula I are administered in combination with CART modulators (see "Cocaine-amphetamine-

- regulated transcript influences energy metabolism, anxiety and gastric emptying in mice" Asakawa, A, et al., M.: Hormone and Metabolic Research (2001), 33(9), 554-558), NPY antagonists, e.g. naphthalene-1-sulfonic acid {4-[(4-aminoquinazolin-2-ylamino)methyl]cyclohexyl-methyl}amide; hydrochloride (CGP 71683A)), MC4 agonists (e.g. 1-amino-1,2,3,4-tetrahydronaphthalene-2-carboxylic acid [2-(3a-benzyl-2-methyl-3-oxo-2,3,3a,4,6,7-hexahydropyrazolo[4,3-c]pyridin-5-yl)-1-(4-chlorophenyl)-2-oxoethyl]-amide; (WO 01/91752)), orexin antagonists (e.g. 1-(2-methylbenzoxazol-6-yl)-3-[1,5]naphthyridin-4-ylurea; hydrochloride (SB-334867-A)), H3 agonists (3-cyclohexyl-1-(4,4-dimethyl-1,4,6,7-tetrahydroimidazo[4,5-c]pyridin-5-yl)propan-1-one oxalic acid salt (WO 00/63208)); TNF agonists, CRF antagonists (e.g. [2-methyl-9-(2,4,6-trimethylphenyl)-9H-1,3,9-triazafluoren-4-yl]dipropylamine (WO 00/66585)), CRF BP antagonists (e.g. urocortin), urocortin agonists, β 3 agonists (e.g. 1-(4-chloro-3-methanesulfonylmethylphenyl)-2-[2-(2,3-dimethyl-1H-indol-6-yloxy)ethylamino]-ethanol hydrochloride (WO 01/83451)), MSH (melanocyte-stimulating hormone) agonists, CCK-A agonists (e.g. {2-[4-(4-chloro-2,5-dimethoxyphenyl)-5-(2-cyclohexylethyl)thiazol-2-ylcarbamoyl]-5,7-dimethylindol-1-yl}acetic acid trifluoroacetic acid salt (WO 99/15525)), serotonin reuptake inhibitors (e.g. dexfenfluramine), mixed serotonergic and noradrenergic compounds (e.g. WO 00/71549), 5HT agonists e.g. 1-(3-ethylbenzofuran-7-yl)piperazine oxalic acid salt (WO 01/09111), bombesin agonists, galanin antagonists, growth hormone (e.g. human growth hormone), growth hormone-releasing compounds (6-benzyloxy-1-(2-diisopropylaminoethylcarbamoyl)-3,4-dihydro-1H-isoquinoline-2-carboxylic acid tert-butyl ester (WO 01/85695)), TRH agonists (see, for example, EP 0 462 884), uncoupling protein 2 or 3 modulators, leptin agonists (see, for example, Lee, Daniel W.; Leinung, Matthew C.; Rozhavskaya-Arena, Marina; Grasso, Patricia. Leptin agonists as a potential approach to the treatment of obesity. *Drugs of the Future* (2001), 26(9), 873-881), DA agonists (bromocriptine, Doprexin), lipase/amylase inhibitors (e.g. WO 00/40569), PPAR modulators (e.g. WO 00/78312), RXR modulators or TR- β agonists.
- In one embodiment of the invention, the other active ingredient is leptin; see, for example, "Perspectives in the therapeutic use of leptin", Salvador, Javier; Gomez-Ambrosi, Javier; Fruhbeck, Gema, *Expert Opinion on Pharmacotherapy* (2001), 2(10), 1615-1622.

In one embodiment, the other active ingredient is dexamphatamine or amphetamine.

5 In one embodiment, the other active ingredient is fenfluramine or dexfenfluramine.

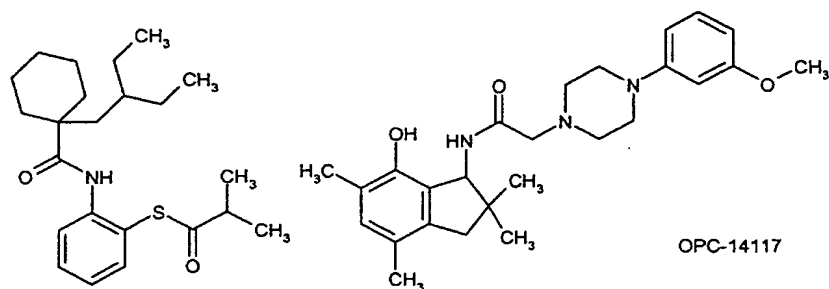
In another embodiment, the other active ingredient is sibutramine or the mono- and bisdemethylated active metabolites of sibutramine.

10 In one embodiment, the other active ingredient is orlistat.

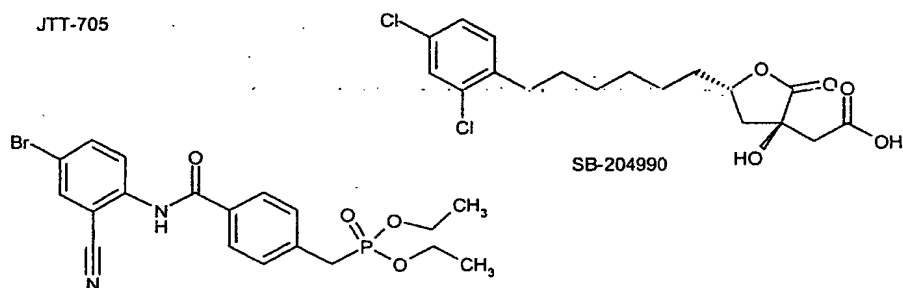
In one embodiment, the other active ingredient is mazindol or phentermine.

15 In one embodiment, the compounds of the formula I are administered in combination with bulking agents, preferably insoluble bulking agents (see, for example, carob/Caromax[®] (Zunft H J; et al., Carob pulp preparation for treatment of hypercholesterolemia, ADVANCES IN THERAPY (2001 Sep-Oct), 18(5), 230-6.) Caromax is a carob-containing product from Nutrinova, Nutrition Specialties & Food Ingredients GmbH, Industriepark
20 Höchst, 65926 Frankfurt/Main)). Combination with Caromax[®] is possible in one preparation or by separate administration of compounds of the formula I and Caromax[®]. Caromax[®] can in this connection also be administered in the form of food products such as, for example, in bakery products or
muesli bars.

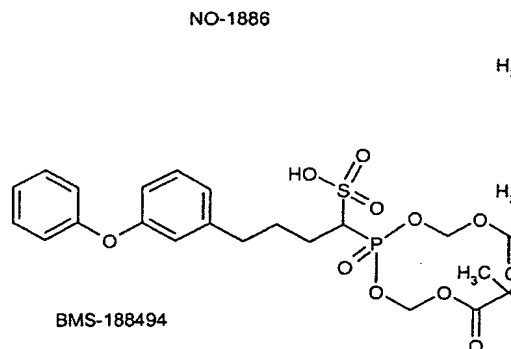
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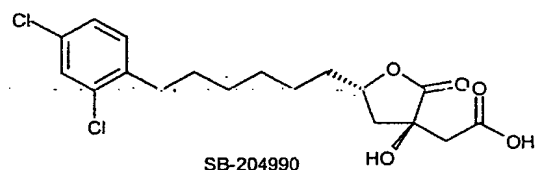
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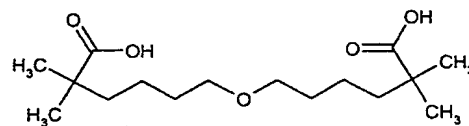
NO-1886



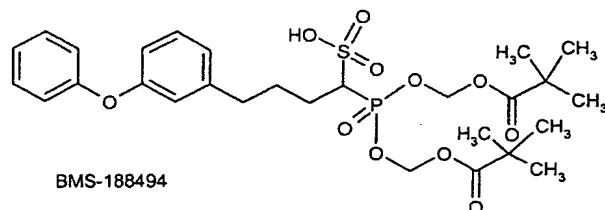
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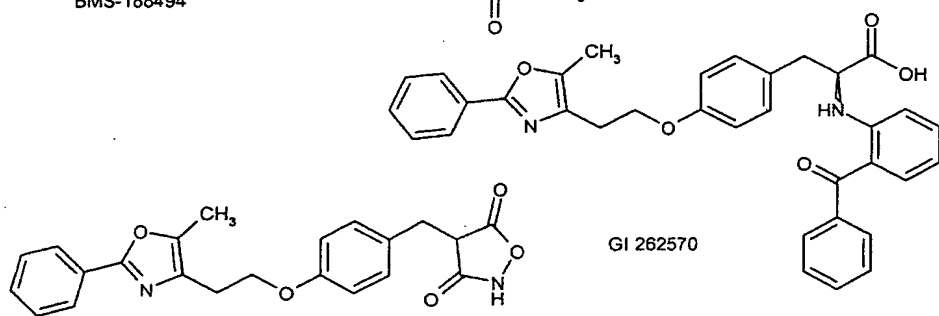
CI-1027



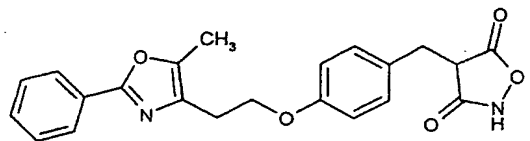
BMS-188494



GI 262570



JTT-501



- The present compounds may additionally be administered in combination with one or more antihypertensive active ingredients. Examples of antihypertensive active ingredients are beta blockers such as alprenolol, atenol, timolol, pindolol, propanolol and metoprolol, ACE (angiotensin converting enzyme) inhibitors such as, for example, benazepril, captopril, enalapril, fosinopril, lisinopril, quinapril and rampril, calcium channel
- 5

blockers such as nifedipine, felodipine, nicardipine, isradipine, nimodipine, diltiazem and verapamil, and alpha blockers such as doxazosin, urapidil, prazosin and terazosin. Reference may furthermore be made to Remington: The Science and Practice of Pharmacy, 19th edition, Gennaro, editor, Mack Publishing Co., Easton, PA, 1995.

It will be appreciated that every suitable combination of the compounds of the invention with one or more of the aforementioned compounds and optionally one or more other pharmacologically active substances is to be regarded as covered by the scope of protection of the present invention.

The citation of any reference herein should not be construed as an admission that such reference is available as "Prior Art" to the instant application.

The present invention is not to be limited in scope by the specific embodiments describe herein. Indeed, various modifications of the invention in addition to those described herein will become apparent to those skilled in the art from the foregoing description and the accompanying figures. Such modifications are intended to fall within the scope of the appended claims.

Various publications are cited herein, the disclosures of which are incorporated by reference in their entireties.

Examples

The efficacy of the compounds was tested as follows:

Biological test model:

The anorectic effect was tested on female NMRI mice. After withdrawal of food for 17 hours, the test product was administered by gavage. The animals were housed singly with free access to drinking water and were offered condensed milk 30 minutes after administration of the product. The condensed milk consumption was determined every half hour for 7 hours,

and the general wellbeing of the animals was observed. The measured milk consumption was compared with the vehicle-treated control animals.

5 Table 1: Anorectic effect measured as the reduction in the cumulative milk consumption of treated compared with control animals

Example	Oral dose [mg/kg]	Number of animals/- cumulative milk consumption of the treated animals N/[ml]	Number of animals/- cumulative milk consumption of the control animals N/[ml]	Reduction in the cumulative milk consumption as % of the control
Example 4	30	5/3.55	5/1.76	50
Example 13	30	5/3.70	5/1.34	64

DESCRIPTION OF EXPERIMENTS

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Functional measurements to find IC50 values

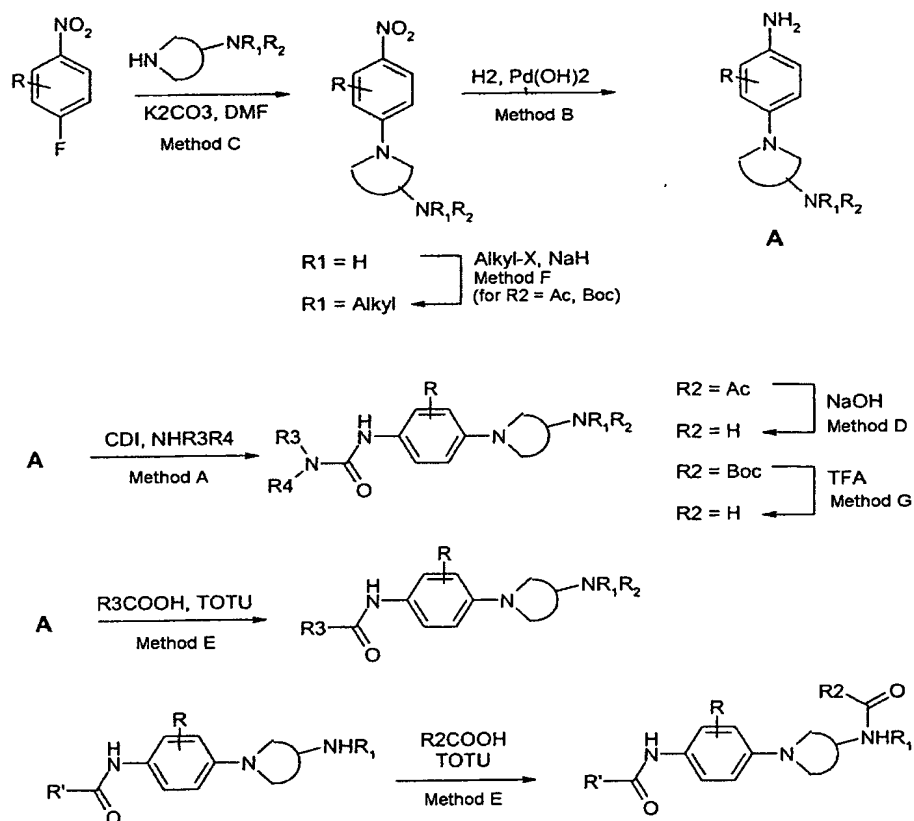
15 The cloning of the cDNA for the human MCH receptor, preparation of a recombinant HEK293 cell line which expresses the human MCH receptor, and functional measurements with the recombinant cell line took place in analogy to the description by Audinot et al. (J. Biol. Chem. 276, 13554-13562, 2001). A difference from the reference was, however, the use of the plasmid pEAK8 from EDGE Biosystems (USA) to construct the expression

20 vector. The host used for the transfection was a transformed HEK cell line named "PEAK Stable Cells" (likewise from EDGE Biosystems). The functional measurements of the cellular calcium flux after addition of agonist (MCH) in the presence of ligand of the invention took place with the aid of the FLIPR apparatus from Molecular Devices (USA) using the

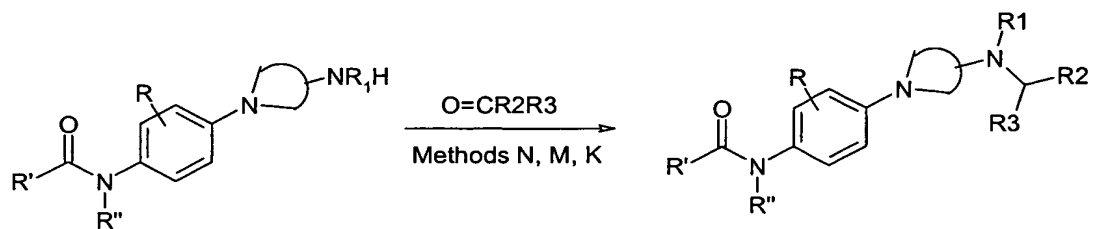
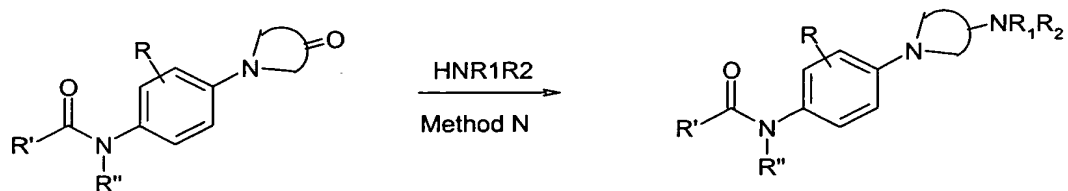
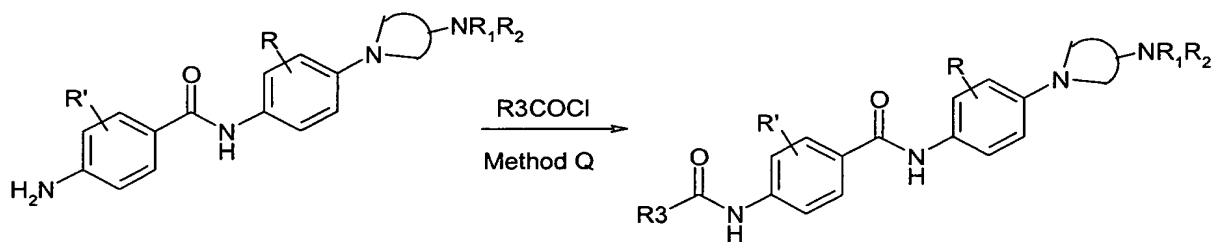
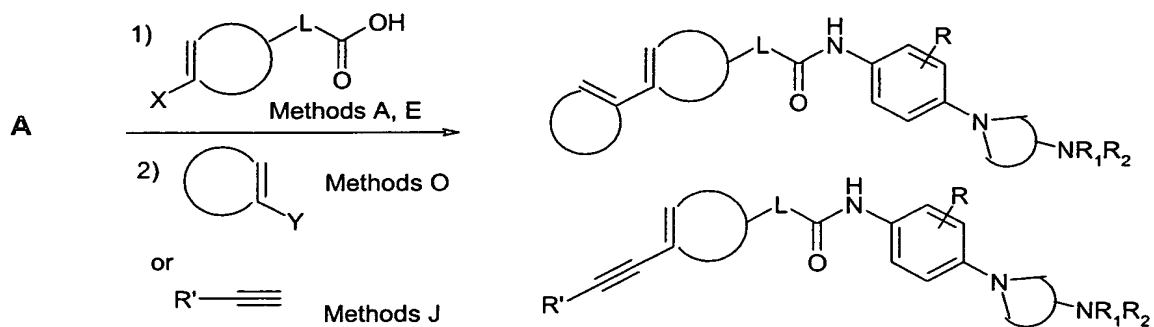
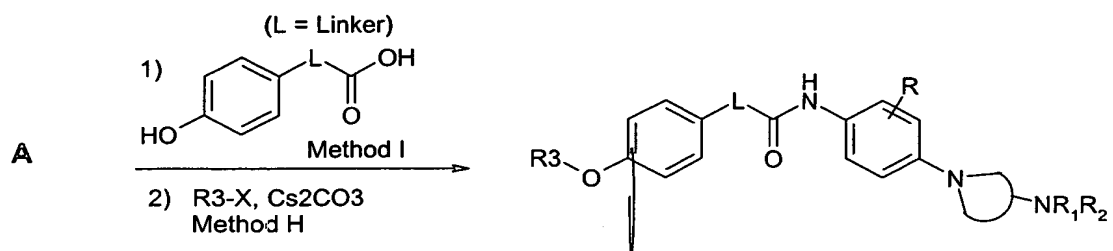
25 protocols of the apparatus manufacturer.

The examples and preparation methods detailed below serve to illustrate the invention without, however, restricting it.

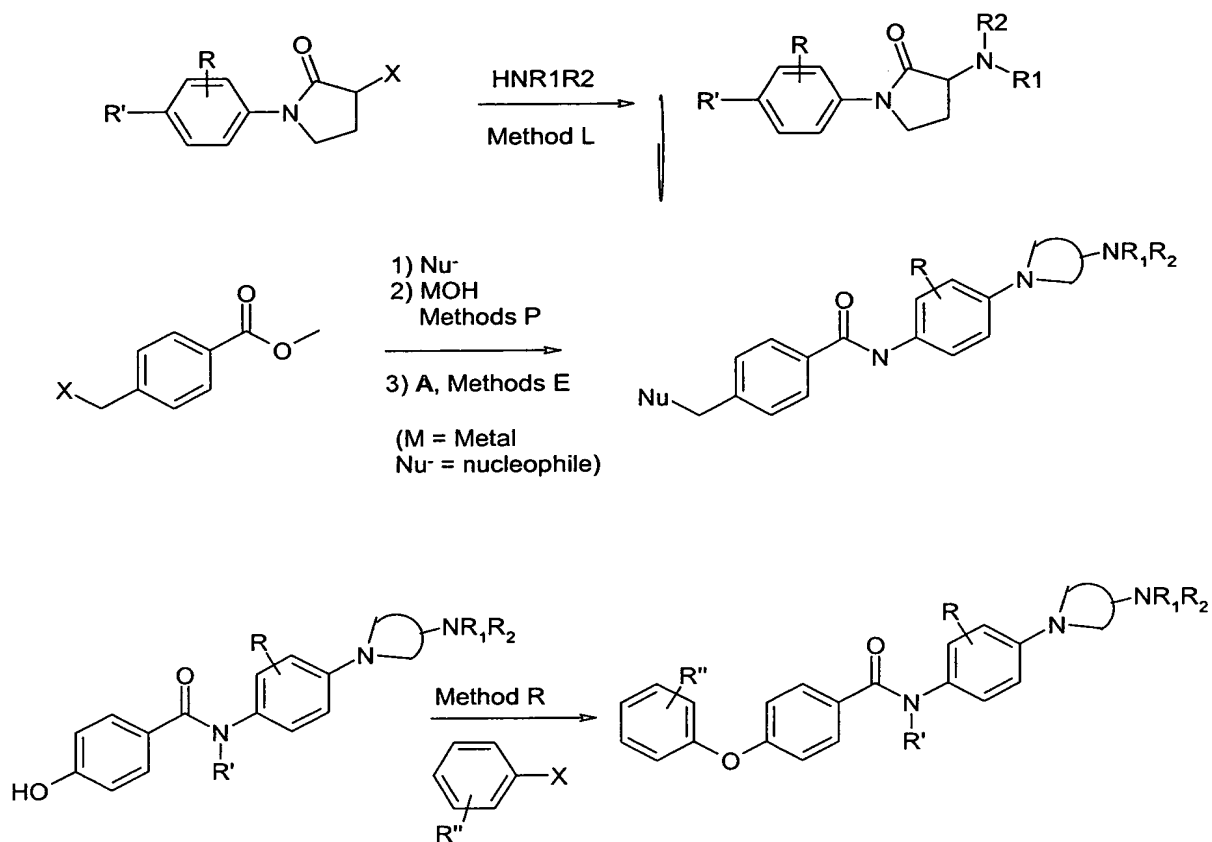
- 5 The compounds of the formula I of the invention can be prepared with the aid of reactions which are known in principle. For example, the compounds were obtained in accordance with the following general reaction schemes.



- 10 Other compounds of the invention can be obtained by further routes which are outlined by way of example in the following scheme.



Yet other examples were obtained as indicated in the following scheme.



- 5 Descriptions of the general methods used are to be found by way of example described at the following places:

Methods A, B and C in example 1;

- 10 Method D in example 2;

Method E in example 3;

Method E-a in example 275;

- 15

Method E-b in example 286;

- Method F in example 4;
- Method F-a in example 264;
- 5 Method G in example 15;
- Method H in example 237;
- Method H-a in example 298;
- Method I in example 238;
- Method J in example 245;
- 10 Method J-a in example 297;
- Method K in example 250;
- Method L in example 254;
- Method M in example 274;
- Method N in example 277;
- 15 Method O in example 279;
- Method O-a in example 292;
- Method O-b in example 280;
- Method P in example 285;
- Method Q in example 290;
- 20 Method R in example 309.

General explanations

- a) Mode of drawing the structural formulae
- 25 Only non-hydrogen atoms are depicted for clarity in the structural formulae of the given examples.

In tables 6-13, enantiomer-enriched compounds are identified by a marked hydrogen atom on the stereogenic center. Unless expressly noted otherwise, the enantiomer-enriched examples shown have the (R) configuration on the 3-aminopyrrolidine stereocenter.

5

b) Salt forms

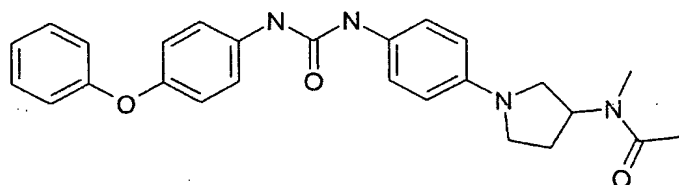
Many of the compounds of the invention are bases and can form salts with appropriately strong acids. In particular, after purification of the compounds by HPLC chromatography using a trifluoroacetic acid-containing mobile
10 phase they may be in the form of hydrotrifluoroacetates. These can be converted into the free bases shown by simple treatment of a solution of the salts for example with sodium carbonate solution.

c) Units of the characterizing data

15 The unit of the stated molecular weight is "g/mol". Peaks observed in the mass spectrum are indicated as the integral quotient of the molar molecular ion mass and the charge of the molecular ion (m/z).

Example 1

20 N-Methyl-N-(1-{4-[3-(4-phenoxyphenyl)ureido]phenyl}pyrrolidin-3-yl)acetamide



Method A

25 A solution of 4-phenoxyaniline (3.33 g) in DMF (10 ml) was added dropwise to a solution of carbonyldiimidazole (2.92 g) in DMF (12 ml) cooled to 0°C. After 30 minutes, N-[1-(4-aminophenyl)pyrrolidin-3-yl]-N-methylacetamide (3.80 g) in DMF (10 ml) was added dropwise. The reaction solution was kept initially at room temperature for 2 hours and then at 80°C for
30 30 minutes. The mixture was added dropwise to water (600 ml) and the resulting precipitate was filtered off with suction and washed with water. Alternatively, the product can also be extracted with ethyl acetate and

purified by chromatography after concentration. This resulted in the product with the molecular weight of 444.54 (C₂₆H₂₈N₄O₃); MS (ESI): 445 (M+H⁺).

5 N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide

Method B

A suspension of N-methyl-N-[1-(4-nitrophenyl)pyrrolidin-3-yl]acetamide (3.5 g) and palladium(II) hydroxide (20% on carbon; 0.9 g) in ethanol (150 ml) and ethyl acetate (300 ml) was vigorously stirred under a
10 hydrogen atmosphere (atmospheric pressure) for 3 hours. The catalyst was then removed by filtration, and the filtrate was concentrated. This resulted in the product with the molecular weight of 233.32 (C₁₃H₁₉N₃O); MS (ESI): 234 (M+H⁺).

15 N-Methyl-N-[1-(4-nitrophenyl)pyrrolidin-3-yl]acetamide

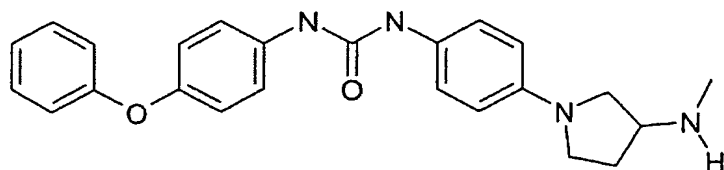
Method C

4-Fluoronitrobenzene (25.0 g) was slowly added to a suspension of N-methyl-N-pyrrolidin-3-ylacetamide (25.2 g) and cesium carbonate (57.6 g) in DMF (300 ml). After 2 hours, the reaction mixture was poured
20 into water, and the resultant precipitate was filtered off with suction. Alternatively, the product can also be extracted with ethyl acetate and purified by chromatography after concentration. This results in the product with the molecular weight of 263.30 (C₁₃H₁₇N₃O₃); MS (ESI): 264 (M+H⁺).

25

Example 2

1-[4-(3-Methylaminopyrrolidin-1-yl)phenyl]-3-(4-phenoxyphenyl)urea



30

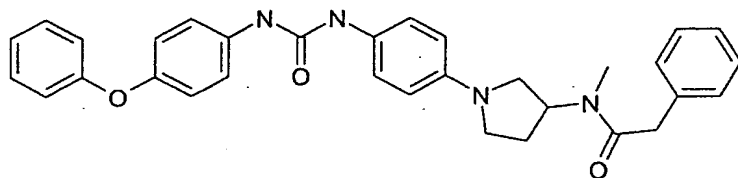
Method D

A mixture of N-methyl-N-(1-{4-[3-(4-phenoxyphenyl)ureido]phenyl}pyrrolidin-3-yl)acetamide (6.0 g), ethanol (250 ml), water (60 ml) and sodium hydroxide solution (10 M; 80 ml) was heated under reflux for 12 hours. The
35 alcohol was distilled out and the resulting precipitate was filtered off with

suction and washed with dichloromethane. Additional product was obtained by concentration of the organic phase and chromatography (silica gel, dichloromethane/methanol 9:1 with 1% triethylamine). This resulted in the product with the molecular weight of 402.50 (C₂₄H₂₆N₄O₂); MS (ESI): 403 (M+H⁺).

Example 3

N-Methyl-N-(1-{4-[3-(4-phenoxyphenyl)ureido]phenyl}pyrrolidin-3-yl)-2-phenylacetamide

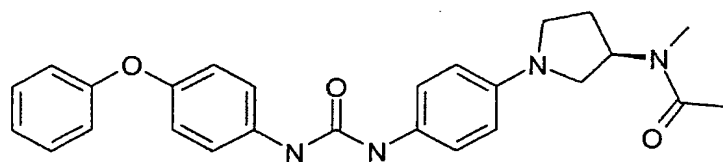


Method E

TOTU (327 mg) was added to a solution of 1-[4-(3-methylaminopyrrolidin-1-yl)phenyl]-3-(4-phenoxyphenyl)urea (402 mg) in DMF (3 ml) at 0°C. After 10 minutes, Hünig's base (130 mg) and then a solution of phenylacetic acid (136 mg) in DMF (1 ml) was added. After a reaction time of 12 hours at room temperature, water was added to the mixture, and it was extracted with ethyl acetate. The organic phase was dried over magnesium sulfate and concentrated. The residue was purified by preparative HPLC. This resulted in the product with the molecular weight of 520.64 (C₃₂H₃₂N₄O₃); MS (ESI): 521 (M+H⁺) as hydrotrifluoroacetate.

Example 4

(*R*)-N-Methyl-N-(1-{4-[3-(4-phenoxyphenyl)ureido]phenyl}pyrrolidin-3-yl)acetamide



(*R*)-N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted

with 4-phenoxyaniline by method A. This resulted in the product with the molecular weight of 444.54 (C₂₆H₂₈N₄O₃); MS (ESI): 445 (M+H⁺).

(*R*)-N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide

5 (*R*)-N-Methyl-N-[1-(4-nitrophenyl)pyrrolidin-3-yl]acetamide was hydrogenated by method B. This resulted in the product with the molecular weight of 233.32 (C₁₃H₁₉N₃O); MS (ESI): 234 (M+H⁺).

(*R*)-N-Methyl-N-[1-(4-nitrophenyl)pyrrolidin-3-yl]acetamide

10

Method F

(*R*)-N-[1-(4-Nitrophenyl)pyrrolidin-3-yl]acetamide (1.3 g) was added in portions to a suspension of sodium hydride (50% in oil; 0.25 g) in DMF (50 ml). After gas evolution had ceased, iodomethane (0.82 g) was added.

15 After one hour, the reaction mixture was cautiously hydrolyzed with water and extracted with ethyl acetate. The organic phase was dried over magnesium sulfate and concentrated. This resulted in the product with the molecular weight of 263.30 (C₁₃H₁₇N₃O₃); MS (ESI): 264 (M+H⁺).

20

(*R*)-N-[1-(4-Nitrophenyl)pyrrolidin-3-yl]acetamide

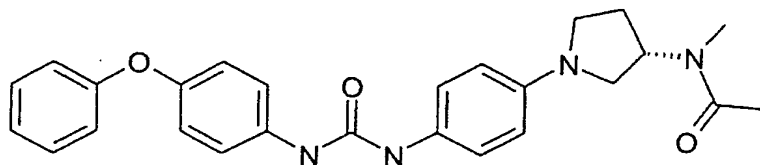
(*R*)-N-pyrrolidin-3-ylacetamide was reacted with 4-fluoronitrobenzene by method C. This resulted in the product with the molecular weight of 249.27 (C₁₂H₁₅N₃O₃); MS (ESI): 250 (M+H⁺).

25

Example 5

(*S*)-N-Methyl-N-(1-{4-[3-(4-phenoxyphenyl)ureido]phenyl}pyrrolidin-3-yl)acetamide

30

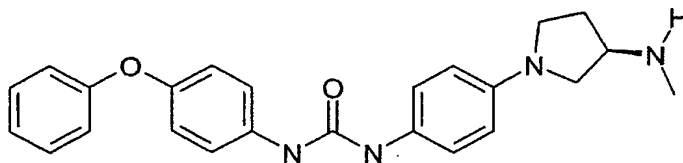


The sequence described in example 4 was applied to (*S*)-N-pyrrolidin-3-ylacetamide. This resulted in the product with the molecular weight of 444.54 (C₂₆H₂₈N₄O₃); MS (ESI): 445 (M+H⁺).

35

Example 6

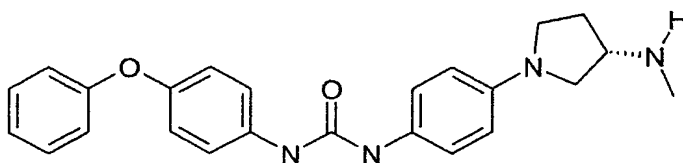
(*R*)-1-[4-(3-Methylaminopyrrolidin-1-yl)phenyl]-3-(4-phenoxyphenyl)urea



- 5 (*R*)-*N*-Methyl-*N*-(1-{4-[3-(4-phenoxyphenyl)ureido]phenyl}pyrrolidin-3-yl)acetamide was reacted by method D. This resulted in the product with the molecular weight of 402.50 (C₂₄H₂₆N₄O₂); MS (ESI): 403 (M+H⁺).

10 Example 7

(*S*)-1-[4-(3-Methylaminopyrrolidin-1-yl)phenyl]-3-(4-phenoxyphenyl)urea



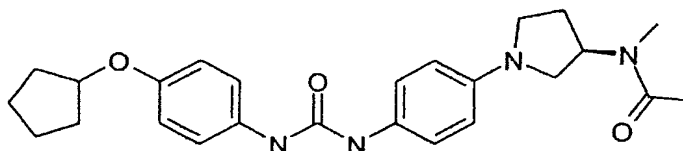
15

(*S*)-*N*-Methyl-*N*-(1-{4-[3-(4-phenoxyphenyl)ureido]phenyl}pyrrolidin-3-yl)acetamide was reacted by method D. This resulted in the product with the molecular weight of 402.50 (C₂₄H₂₆N₄O₂); MS (ESI): 403 (M+H⁺).

20

Example 8

(*R*)-*N*-(1-{4-[3-(4-Cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)-*N*-methylacetamide



25

(*R*)-*N*-(1-(4-Aminophenyl)pyrrolidin-3-yl)-*N*-methylacetamide was reacted

with 4-cyclopentyloxyaniline by method A. This resulted in the product with the molecular weight of 436.56 (C₂₅H₃₂N₄O₃); MS (ESI): 437 (M+H⁺).

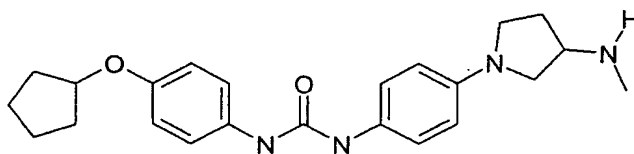
(S)-N-(1-{4-[3-(4-cyclopentyloxy-phenyl)-ureido]-phenyl}-pyrrolidin-3-yl)-N-methyl-acetamide was obtained analogously from (S)-N-[1-(4-amino-phenyl)-pyrrolidin-3-yl]-N-methyl-acetamide.

4-Cyclopentyloxyaniline

A mixture of 4-nitrophenol (63.7 g), bromocyclopentane (68.2 g), potassium carbonate (63.3 g) and DMF (300 ml) was heated at 80°C for 24 hours. After cooling, it was diluted with water and extracted with ethyl acetate. The organic phase was washed with water, dried over magnesium sulfate and concentrated. The residue was hydrogenated by method B. This resulted in the product with the molecular weight of 177.25 (C₁₁H₁₅NO); MS (ESI): 178 (M+H⁺).

Example 9

1-(4-Cyclopentyloxyphenyl)-3-[4-(3-methylaminopyrrolidin-1-yl)phenyl]urea

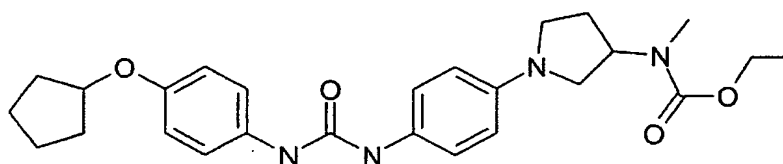


N-(1-{4-[3-(4-Cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)-N-methylacetamide was reacted by method D. This resulted in the product with the molecular weight of 394.52 (C₂₃H₃₀N₄O₂); MS (ESI): 395 (M+H⁺).

(R)- and (S)-1-(4-cyclopentyloxy-phenyl)-3-[4-(3-methylamino-pyrrolidin-1-yl)-phenyl]-urea was obtained analogously from (R)- and (S)-N-(1-{4-[3-(4-cyclopentyloxy-phenyl)-ureido]-phenyl}-pyrrolidin-3-yl)-N-methyl-acetamide.

Example 10

Ethyl (1-{4-[3-(4-Cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)methyl-carbamate



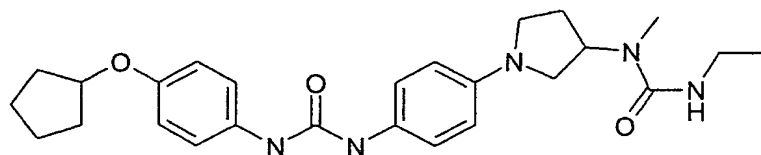
Ethyl chloroformate (8 μ l) was added dropwise to a solution of 1-(4-cyclopentyloxyphenyl)-3-[4-(3-methylaminopyrrolidin-1-yl)phenyl]urea (20 mg) and Hünig's base (10 mg) in dichloromethane (3 ml). After 12 hours, the reaction mixture was concentrated and the residue was purified by preparative HPLC. This resulted in the product with the molecular weight of 466.59 (C₂₆H₃₄N₄O₄); MS (ESI): 467 (M+H⁺) as hydrotrifluoroacetate.

10

Example 11

1-(1-{4-[3-(4-Cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)-3-ethyl-1-methylurea

15



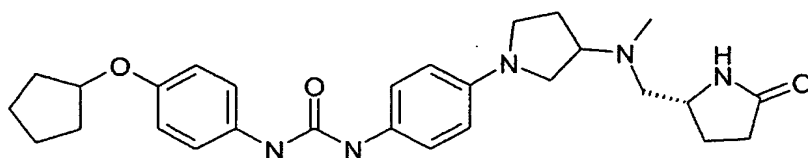
Ethyl isocyanate (7 μ l) was added dropwise to a solution of 1-(4-cyclopentyloxyphenyl)-3-[4-(3-methylaminopyrrolidin-1-yl)phenyl]urea (20 mg) and Hünig's base (10 mg) in dichloromethane (3 ml). After 12 hours, the reaction mixture was concentrated and the residue was purified by preparative HPLC. This resulted in the product with the molecular weight of 465.60 (C₂₆H₃₅N₅O₃); MS (ESI): 466 (M+H⁺) as hydrotrifluoroacetate.

20

25 Example 12

1-(4-Cyclopentyloxyphenyl)-3-(4-{3-[methyl-((R)-5-oxo-pyrrolidin-2-ylmethyl)amino]pyrrolidin-1-yl}phenyl)urea

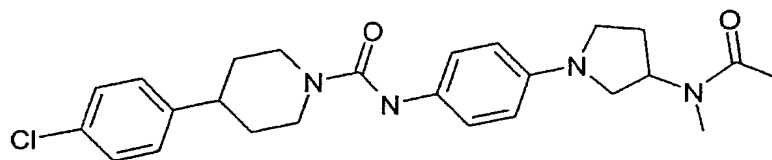
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(*R*)-5-Bromomethylpyrrolidin-2-one (15 mg) was added to a suspension of 1-(4-cyclopentyloxyphenyl)-3-[4-(3-methylaminopyrrolidin-1-yl)phenyl]urea (30 mg) and potassium carbonate (20 mg) in DMF (3 ml). After 2 hours, the reaction mixture was filtered and concentrated, and the residue was purified by preparative HPLC. This resulted in the product with the molecular weight of 491.64 (C₂₈H₃₇N₅O₃); MS (ESI): 492 (M+H⁺) as hydrotrifluoroacetate.

Example 13

4-(4-Chlorophenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide

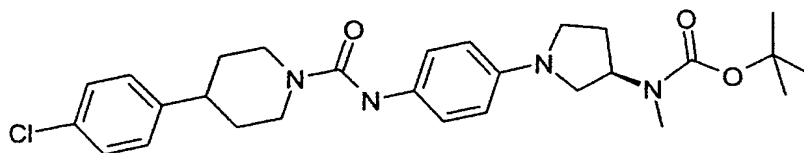


N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted with carbonyldiimidazole and then with 4-(4-chlorophenyl)piperidine by method A. This resulted in the product with the molecular weight of 455.00 (C₂₅H₃₁ClN₄O₂); MS (ESI): 455 (M+H⁺).

(*R*)- and (*S*)-4-(4-chlorophenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide were obtained analogously from (*R*)- and (*S*)-N-[1-(4-aminophenyl)pyrrolidin-3-yl]-N-methylacetamide.

Example 14

tert-Butyl (*R*)-[1-(4-{[4-(4-chlorophenyl)piperidine-1-carbonyl]amino}phenyl)pyrrolidin-3-yl]methylcarbamate



tert-Butyl (*R*)-[1-(4-aminophenyl)pyrrolidin-3-yl]methylcarbamate was reacted with carbonyldiimidazole and then with 4-(4-chlorophenyl)piperidine by method A. This resulted in the product with the molecular weight of 513.09 (C₂₈H₃₇ClN₄O₃); MS (ESI): 513 (M+H⁺).

tert-Butyl (*R*)-[1-(4-aminophenyl)pyrrolidin-3-yl]methylcarbamate

tert-Butyl (*R*)-methyl-[1-(4-nitrophenyl)pyrrolidin-3-yl]carbamate was hydrogenated by method B. This resulted in the product with the molecular weight of 291.40 (C₁₆H₂₅N₃O₂); MS (ESI): 292 (M+H⁺).

tert-Butyl (*R*)-methyl-[1-(4-nitrophenyl)pyrrolidin-3-yl]carbamate

tert-Butyl (*R*)-[1-(4-nitrophenyl)pyrrolidin-3-yl]carbamate was alkylated with iodomethane by method F. This resulted in the product with the molecular weight of 321.38 (C₁₆H₂₃N₃O₄); MS (ESI): 322 (M+H⁺).

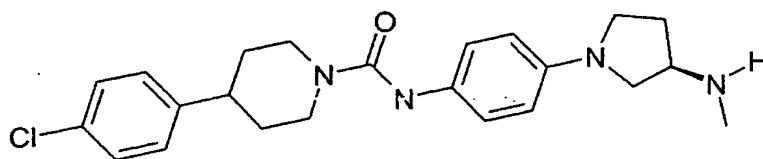
tert-Butyl (*R*)-[1-(4-nitrophenyl)pyrrolidin-3-yl]carbamate

tert-Butyl (*R*)-pyrrolidin-3-ylcarbamate was reacted with 4-fluoronitrobenzene by method C. This resulted in the product with the molecular weight of 307.35 (C₁₅H₂₁N₃O₄); MS (ESI): 308 (M+H⁺).

Example 15

(*R*)-4-(4-Chlorophenyl)piperidine-1-carboxylic acid [4-(3-methylamino-pyrrolidin-1-yl)phenyl]amide

87

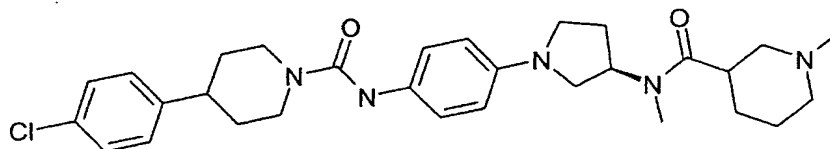


Method G

- 5 Trifluoroacetic acid (6.67 g) was added to a solution of tert-butyl (*R*)-[1-(4-
 {[4-(4-chlorophenyl)piperidin-1-carbonyl]amino}phenyl)pyrrolidin-
 3-yl]methylcarbamate (1.5 g) in dichloromethane (50 ml). After 3 hours,
 volatile fractions were removed and the residue was taken up in
 dichloromethane. After washing with sodium carbonate solution, the
 10 organic phase was dried over magnesium sulfate and concentrated. This
 resulted in the product with the molecular weight of 412.97
 (C₂₃H₂₉ClN₄O); MS (ESI): 413 (M+H⁺).

Example 16

- 15 4-(4-Chlorophenyl)piperidine-1-carboxylic acid (4-{(*R*)-3-[methyl-(1-methyl-
 piperidin-3-ylcarbonyl)amino]pyrrolidin-1-yl}phenyl)amide

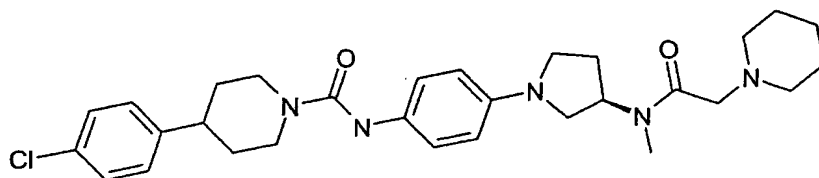


- 20 (*R*)-4-(4-Chlorophenyl)piperidine-1-carboxylic acid [4-(3-methylamino-
 pyrrolidin-1-yl)phenyl]amide was reacted with 1-methylpiperidine-3-
 carboxylic acid by method E. This resulted in the product with the molecular
 weight of 538.14 (C₃₀H₄₀ClN₅O₂); MS (ESI): 538 (M+H⁺).

25

Example 17

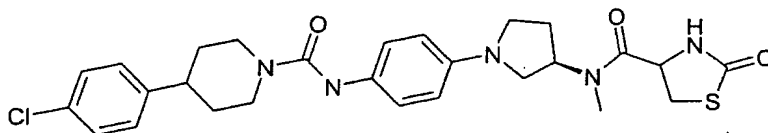
- 4-(4-Chlorophenyl)piperidine-1-carboxylic acid (4-(*R*)-{3-[methyl-(2-
 piperidin-1-ylacetyl)amino]pyrrolidin-1-yl}phenyl)amide



- (*R*)-4-(4-Chlorophenyl)piperidine-1-carboxylic acid [4-(3-methylamino-pyrrolidin-1-yl)phenyl]amide was reacted with piperidin-1-ylacetic acid by method E. This resulted in the product with the molecular weight of 538.14 (C₃₀H₄₀ClN₅O₂); MS (ESI): 538 (M+H⁺).

Example 18

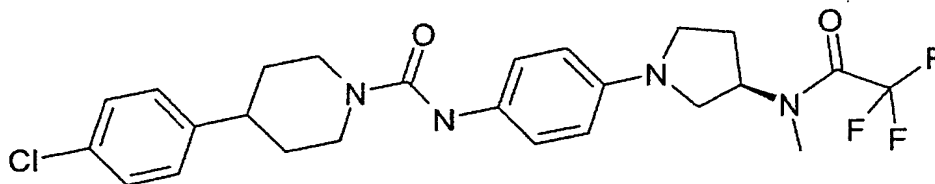
- 10 4-(4-Chlorophenyl)piperidine-1-carboxylic acid (4-(*R*)-{3-[methyl-(2-oxothiazolidine-4-carbonyl)amino]pyrrolidin-1-yl}phenyl)amide



- 15 (*R*)-4-(4-Chlorophenyl)piperidine-1-carboxylic acid [4-(3-methylamino-pyrrolidin-1-yl)phenyl]amide was reacted with 2-oxothiazolidine-4-carboxylic acid by method E. This resulted in the product with the molecular weight of 542.10 (C₂₇H₃₂ClN₅O₃S); MS (ESI): 542 (M+H⁺).

Example 19

- 20 (*R*)-4-(4-Chlorophenyl)piperidine-1-carboxylic acid (4-{3-[methyl-(2,2,2-trifluoroacetyl)amino]pyrrolidin-1-yl}phenyl)amide



25

- (*R*)-[N-[1-(4-aminophenyl)pyrrolidin-3-yl]-2,2,2-trifluoro-N-methylacetamide was reacted with carbonyldiimidazole and then with 4-(4-chlorophenyl)-piperidine by method A. This resulted in the product with the molecular

weight of 508.98 (C₂₅H₂₈ClF₃N₄O₂); MS (ESI): 509 (M+H⁺).

(*R*)-[N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-2,2,2-trifluoro-N-methylacetamide

5

(*R*)-2,2,2-Trifluoro-N-methyl-N-[1-(4-nitrophenyl)pyrrolidin-3-yl]acetamide was hydrogenated by method B. This resulted in the product with the molecular weight of 287.29 (C₁₃H₁₆F₃N₃O); MS (ESI): 288 (M+H⁺).

10 (*R*)-2,2,2-Trifluoro-N-methyl-N-[1-(4-nitrophenyl)pyrrolidin-3-yl]acetamide

Trifluoroacetic anhydride (0.5 ml) was added dropwise to a solution of (*R*)-methyl-[1-(4-nitrophenyl)pyrrolidin-3-yl]amine (0.48 g) in pyridine (2 ml). After 3 hours, the reaction mixture was diluted with water and extracted with ethyl acetate. The organic phase was washed with citric acid solution, dried over magnesium sulfate and concentrated. This resulted in the product with the molecular weight of 317.27 (C₁₃H₁₄F₃N₃O₃); MS (ESI): 318 (M+H⁺).

20 (*R*)-Methyl-[1-(4-nitrophenyl)pyrrolidin-3-yl]amine

A solution of tert-butyl (*R*)-methyl-[1-(4-nitrophenyl)pyrrolidin-3-yl]-carbamate (0.7 g) in dichloromethane (5 ml) was treated with trifluoroacetic acid (3 ml) for 1 hour. The reaction solution was concentrated and the residue was taken up in dichloromethane. After washing with sodium carbonate solution, the organic phase was dried over magnesium sulfate and concentrated. This resulted in the product with the molecular weight of 221.26 (C₁₁H₁₅N₃O₂); MS (ESI): 222 (M+H⁺).

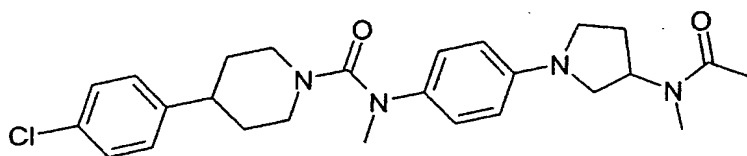
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Example 20

4-(4-Chlorophenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)-pyrrolidin-1-yl]phenyl}methanamide

35

90

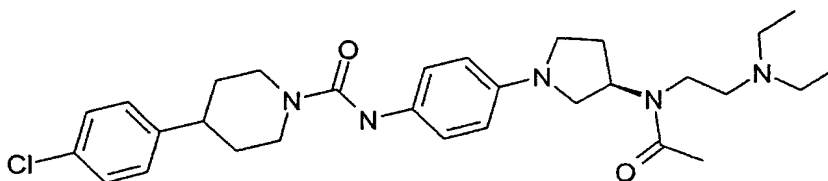


4-(4-Chlorophenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide was reacted with iodomethane by method F.

- 5 This resulted in the product with the molecular weight of 469.03 (C₂₆H₃₃ClN₄O₂); MS (ESI): 469 (M+H⁺).

Example 21

- 10 (*R*)-4-(4-Chlorophenyl)piperidine-1-carboxylic acid (4-{3-[acetyl-(2-diethylaminoethyl)amino]pyrrolidin-1-yl}phenyl)amide



- 15 (*R*)-N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-(2-diethylaminoethyl)acetamide was reacted with 4-(4-chlorophenyl)piperidine by method A. This resulted in the product with the molecular weight of 540.15 (C₃₀H₄₂ClN₅O₂); MS (ESI): 540 (M+H⁺).

- 20 (*R*)-N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-(2-diethylaminoethyl)acetamide (*R*)-N-(2-Diethylaminoethyl)-N-[1-(4-nitrophenyl)pyrrolidin-3-yl]acetamide was hydrogenated by method B. This resulted in the product with the molecular weight of 318.47 (C₁₈H₃₀N₄O); MS (ESI): 319 (M+H⁺).

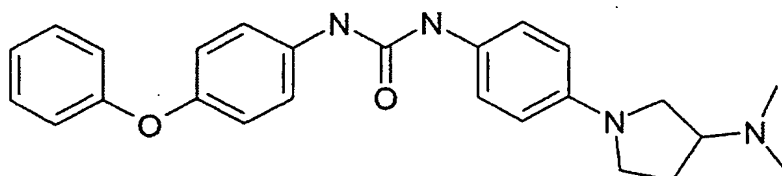
25

(*R*)-N-(2-Diethylaminoethyl)-N-[1-(4-nitrophenyl)pyrrolidin-3-yl]acetamide

- 30 (*R*)-N-[1-(4-nitrophenyl)pyrrolidin-3-yl]acetamide was reacted with 2-chloroethyldiethylamine by method F. This resulted in the product with the molecular weight of 348.45 (C₁₈H₂₈N₄O₃); MS (ESI): 349 (M+H⁺).

Example 22

1-[4-(3-Dimethylaminopyrrolidin-1-yl)phenyl]-3-(4-phenoxyphenyl)urea



5

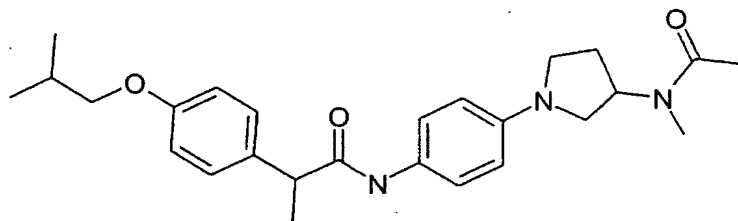
Dimethylpyrrolidin-3-ylamine was reacted with 4-fluoronitrobenzene, the resulting nitro compound was reduced with hydrogen and finally the aniline was reacted with CDI and 4-phenoxyaniline by method A, B and C. This resulted in the product with the molecular weight of 416.53 (C₂₅H₂₈N₄O₂); MS (ESI): 417 (M+H⁺).

10

Example 23

N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-2-(4-isobutoxyphenyl)propionamide

15

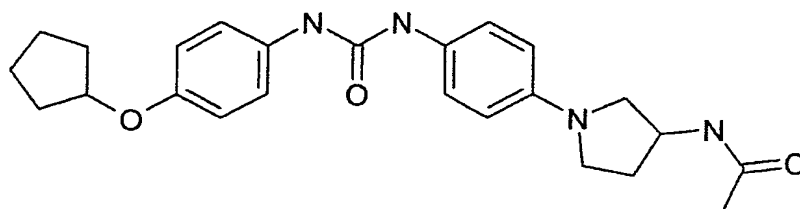


N-[1-(4-aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted with 2-(4-isobutoxyphenyl)propionic acid by method E. This resulted in the product with the molecular weight of 437.59 (C₂₆H₃₅N₃O₃); MS (ESI): 438 (M+H⁺).

20

25 Example 24

N-(1-{4-[3-(4-Cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)acetamide

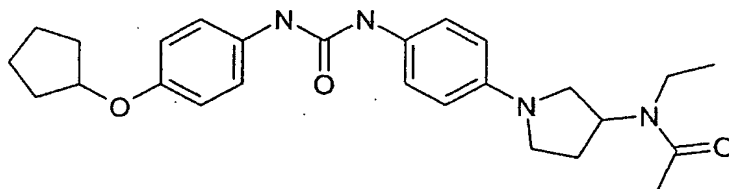


N-Pyrrolidin-3-ylacetamide was reacted with 4-fluoronitrobenzene, the resulting nitro compound was reduced with hydrogen and finally the aniline was reacted with CDI and 4-cyclopentyloxyaniline by method A, B and C. This resulted in the product with the molecular weight of 422.53 (C₂₄H₃₀N₄O₃); MS (ESI): 423 (M+H⁺).

(*R*)- and (*S*)-N-(1-(4-[3-(4-cyclopentyloxyphenyl)ureido]phenyl)pyrrolidin-3-yl)acetamide were obtained in an analogous manner starting from (*R*)- and (*S*)-N-pyrrolidin-3-ylacetamide.

Example 25

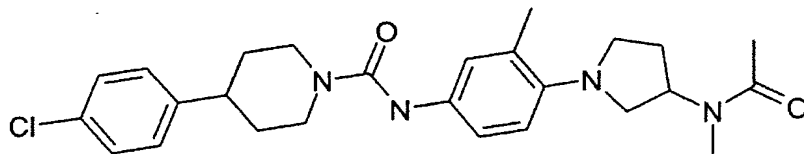
N-(1-(4-[3-(4-Cyclopentyloxyphenyl)ureido]phenyl)pyrrolidin-3-yl)-N-ethylacetamide



N-Ethyl-N-pyrrolidin-3-ylacetamide was reacted with 4-fluoronitrobenzene, the resulting nitro compound was reduced with hydrogen and finally the aniline was reacted with CDI and 4-cyclopentyloxyaniline by method A, B and C. This resulted in the product with the molecular weight of 450.59 (C₂₆H₃₄N₄O₃); MS (ESI): 451 (M+H⁺).

Example 26

4-(4-Chlorophenyl)piperidin-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]-3-methylphenyl}amide



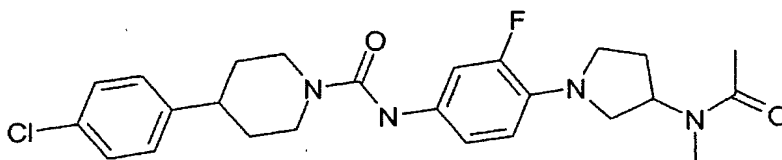
5 N-Methyl-N-pyrrolidin-3-ylacetamide was reacted with 1-fluoro-2-methyl-4-nitrobenzene, the resulting nitro compound was reduced with hydrogen and finally the aniline was reacted with CDI and 4-(4-chlorophenyl)piperidine by method A, B and C. This resulted in the product with the molecular weight of 469.03 (C₂₆H₃₃ClN₄O₂); MS (ESI): 469 (M+H⁺).

10

Example 27

4-(4-Chlorophenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)-pyrrolidin-1-yl]-3-fluorophenyl}amide

15

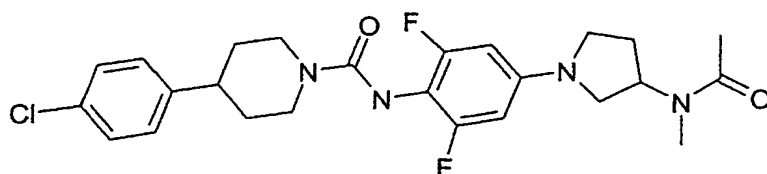


20 N-Methyl-N-pyrrolidin-3-ylacetamide was reacted with 1,2-difluoro-4-nitrobenzene, the resulting nitro compound was reduced with hydrogen and finally the aniline was reacted with CDI and 4-(4-chlorophenyl)piperidine by method A, B and C. This resulted in the product with the molecular weight of 472.99 (C₂₅H₃₀ClF₂N₄O₂); MS (ESI): 473 (M+H⁺).

25

Example 28

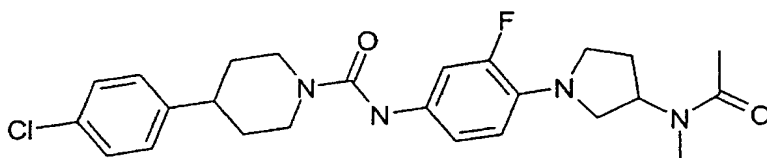
4-(4-Chlorophenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)-pyrrolidin-1-yl]-2,6-difluorophenyl}amide



- 5 N-Methyl-N-pyrrolidin-3-ylacetamide was reacted with 1,3,5-trifluoro-2-nitrobenzene, the resulting nitro compound was reduced with hydrogen and finally the aniline was reacted with CDI and 4-(4-chlorophenyl)piperidine by method A, B and C. This resulted in the product with the molecular weight of 490.99 (C₂₅H₂₉ClF₂N₄O₂); MS (ESI): 491 (M+H⁺).

10 Example 29

4-(4-Chlorophenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)-pyrrolidin-1-yl]-2-methylphenyl}amide



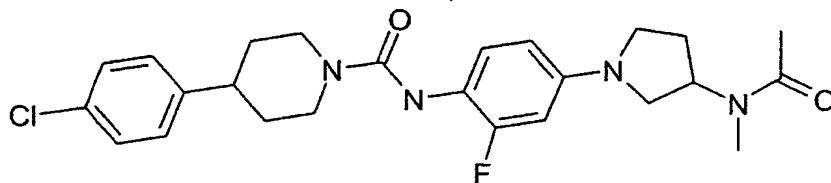
- 15 N-Methyl-N-pyrrolidin-3-ylacetamide was reacted with 4-fluoro-2-methyl-1-nitrobenzene, the resulting nitro compound was reduced with hydrogen and finally the aniline was reacted with CDI and 4-(4-chlorophenyl)piperidine by method A, B and C. This resulted in the product with the molecular weight of 469.03 (C₂₆H₃₃ClN₄O₂); MS (ESI): 469 (M+H⁺).

20

Example 30

4-(4-Chlorophenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)-pyrrolidin-1-yl]-2-fluorophenyl}amide

25



N-Methyl-N-pyrrolidin-3-ylacetamide was reacted with 2,4-difluoro-1-

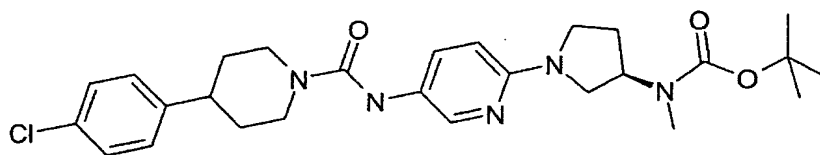
nitrobenzene, the resulting nitro compound was reduced with hydrogen and finally the aniline was reacted with CDI and 4-(4-chlorophenyl)piperidine by method A, B and C. This resulted in the product with the molecular weight of 472.99 (C₂₅H₃₀ClFN₄O₂); MS (ESI): 473 (M+H⁺).

5

Example 31

tert-Butyl (*R*)-[1-(5-{[4-(4-Chlorophenyl)piperidin-1-carbonyl]amino}pyridin-2-yl)pyrrolidin-3-yl]methylcarbamate

10



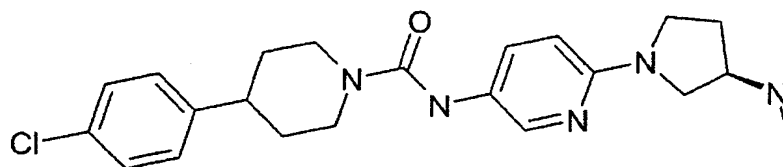
The synthetic sequence for preparing tert-butyl (*R*)-[1-(4-{[4-(4-chlorophenyl)piperidin-1-carbonyl]amino}phenyl)pyrrolidin-3-yl]methylcarbamate was carried out starting from 2-chloro-5-nitropyridine instead of 4-fluoronitrobenzene. This resulted in the product with the molecular weight of 514.07 (C₂₇H₃₆ClN₅O₃); MS (ESI): 514 (M+H⁺).

15

Example 32

(*R*)-[4-(4-Chlorophenyl)piperidine-1-carboxylic acid [6-(3-methylaminopyrrolidin-1-yl)pyridin-3-yl]amide

20



tert-Butyl (*R*)-[1-(5-{[4-(4-chlorophenyl)piperidine-1-carbonyl]amino}pyridin-2-yl)pyrrolidin-3-yl]methylcarbamate was treated with trifluoroacetic acid by method G. This resulted in the product with the molecular weight of 413.95 (C₂₂H₂₈ClN₅O); MS (ESI): 414 (M+H⁺).

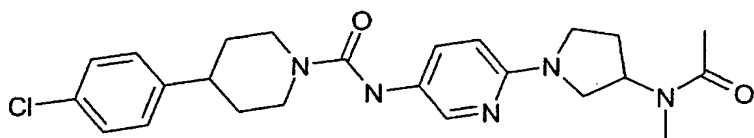
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It was possible to obtain racemic [4-(4-chlorophenyl)piperidine-1-carboxylic acid [6-(3-methylaminopyrrolidin-yl)pyridin-3-yl]amide in a similar manner.

30

Example 33

4-(4-Chlorophenyl)piperidine-1-carboxylic acid {6-[3-(acetylmethylamino)-pyrrolidin-1-yl]pyridin-3-yl}amide



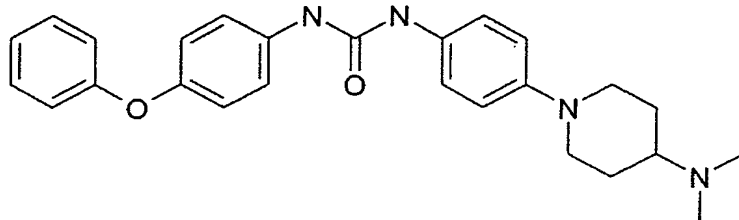
5

N-Methyl-N-pyrrolidin-3-ylacetamide was reacted with 2-chloro-5-nitropyridine, the resulting nitro compound was reduced with hydrogen and finally the aniline was reacted with CDI and 4-(4-chlorophenyl)piperidine by method A, B and C. This resulted in the product with the molecular weight of 490.99 (C₂₅H₂₉ClF₂N₄O₂); MS (ESI): 491 (M+H⁺).

10

Example 34

1-[4-(4-Dimethylaminopiperidin-1-yl)phenyl]-3-(4-phenoxyphenyl)urea



15

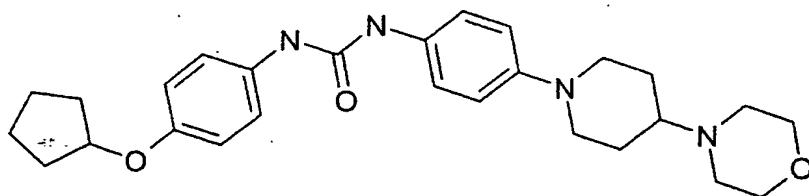
Dimethylpiperidin-4-ylamine was reacted with 4-fluoronitrobenzene, the resulting nitro compound was reduced with hydrogen and finally the aniline ([1-(4-aminophenyl)piperidin-4-yl]dimethylamine) was reacted with CDI and 4-phenoxyaniline by method A, B and C. This resulted in the product with the molecular weight of 430.55 (C₂₆H₃₀N₄O₂); MS (ESI): 431 (M+H⁺).

20

Example 35

1-(4-Cyclopentyloxyphenyl)-3-[4-(4-morpholin-4-ylpiperidin-1-yl)phenyl]urea

25

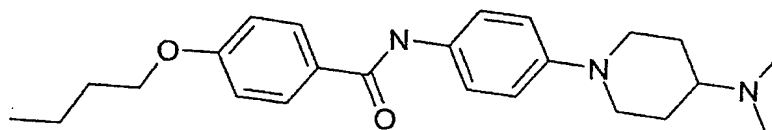


4-Piperidin-4-ylmorpholine was reacted with 4-fluoronitrobenzene, the resulting nitro compound was reduced with hydrogen and finally the aniline was reacted with CDI and 4-cyclopentyloxyaniline by method A, B and C.

- 5 This resulted in the product with the molecular weight of 464.61 (C₂₇H₃₆N₄O₃); MS (ESI): 465 (M+H⁺).

Example 36

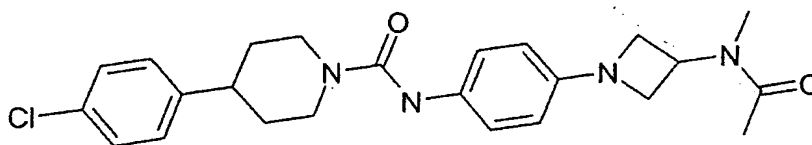
- 10 4-Butoxy-N-[4-(4-dimethylaminopiperidin-1-yl)phenyl]benzamide



- 15 ([1-(4-Aminophenyl)piperidin-4-yl]dimethylamine) was reacted with 4-4-butoxybenzoic acid by method E. This resulted in the product with the molecular weight of 395.55 (C₂₄H₃₃N₃O₂); MS (ESI): 396 (M+H⁺).

Example 37

- 20 4-(4-Chlorophenyl)piperidin-1-carboxylic acid {4-[3-(acetylmethylamino)-azetidin-1-yl]phenyl}amide



- 25 N-[1-(4-aminophenyl)azetidin-3-yl]-N-methylacetamide was reacted with carbonyldiimidazole and 4-(4-chlorophenyl)piperidine by method A. This resulted in the product with the molecular weight of 440.98 (C₂₄H₂₉ClN₄O₂); MS (ESI): 441 (M+H⁺).

- 30 N-[1-(4-Aminophenyl)azetidin-3-yl]-N-methylacetamide
N-Methyl-N-[1-(4-nitrophenyl)azetidin-3-yl]acetamide was hydrogenated by method B. This resulted in the product with the molecular weight of 219.29 (C₁₂H₁₇N₃O); MS (ESI): 220 (M+H⁺).

N-Methyl-N-[1-(4-nitrophenyl)azetidin-3-yl]acetamide

N-[1-(4-nitrophenyl)azetidin-3-yl]acetamide was alkylated with iodomethane by method F. This resulted in the product with the molecular weight of 249.27 (C₁₂H₁₅N₃O₃); MS (ESI): 250 (M+H⁺).

N-[1-(4-Nitrophenyl)azetidin-3-yl]acetamide

Acetic anhydride (0.6 ml) was added to a solution of 1-(4-nitrophenyl)-azetidin-3-ylamine (0.5 g) in pyridine (1.2 ml). After one hour, volatile fractions were removed. This resulted in the product with the molecular weight of 235.24 (C₁₁H₁₃N₃O₃); MS (ESI): 236 (M+H⁺).

1-(4-Nitrophenyl)azetidin-3-ylamine

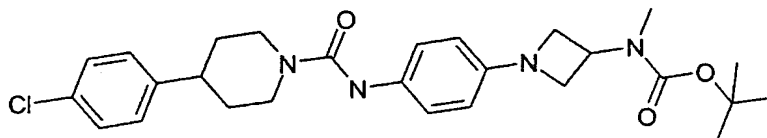
tert-Butyl [1-(4-nitrophenyl)azetidin-3-yl]carbamate was treated with trifluoroacetic acid by method G. This resulted in the product with the molecular weight of 193.21 (C₉H₁₁N₃O₂); MS (ESI): 194 (M+H⁺).

tert-Butyl [1-(4-nitrophenyl)azetidin-3-yl]carbamate

tert-Butyl azetidin-3-ylcarbamate was reacted with 4-fluoronitrobenzene by method C. This resulted in the product with the molecular weight of 293.33 (C₁₄H₁₉N₃O₄); MS (ESI): 294 (M+H⁺).

Example 38

tert-Butyl [1-(4-[[4-(4-Chlorophenyl)piperidin-1-carbonyl]amino]-phenyl)azetidin-3-yl]methylcarbamate



tert-Butyl [1-(4-aminophenyl)azetidin-3-yl]methylcarbamate was reacted with carbonyldiimidazole and 4-(4-chlorophenyl)piperidine by method A.

This resulted in the product with the molecular weight of 499.06 (C₂₇H₃₅ClN₄O₃; MS (ESI): 499 (M+H⁺).

tert-Butyl [1-(4-aminophenyl)azetidin-3-yl]methylcarbamate

tert-Butyl methyl-[1-(4-nitrophenyl)azetidin-3-yl]carbamate was

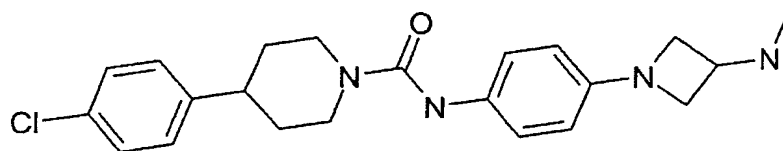
- 5 hydrogenated by method B. This resulted in the product with the molecular weight of 277.37 (C₁₅H₂₃N₃O₂); MS (ESI): 278 (M+H⁺).

tert-Butyl methyl-[1-(4-nitrophenyl)azetidin-3-yl]carbamate

- 10 tert-Butyl [1-(4-nitrophenyl)azetidin-3-yl]carbamate was alkylated with iodomethane by method F. This resulted in the product with the molecular weight of 307.35 (C₁₅H₂₁N₃O₄); MS (ESI): 308 (M+H⁺).

15 Example 39

4-(4-Chlorophenyl)piperidin-1-carboxylic acid [4-(3-methylaminoazetidin-1-yl)phenyl]amide

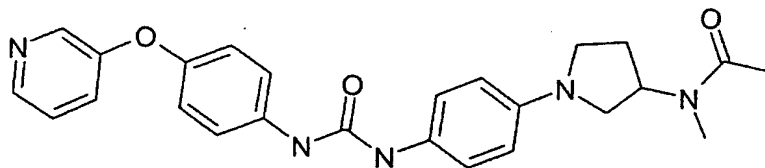


- 20 tert-Butyl [1-(4-[[4-(4-chlorophenyl)piperidin-1-carbonyl]amino]-phenyl)azetidin-3-yl]methylcarbamate was reacted with trifluoroacetic acid by method G. This resulted in the product with the molecular weight of 398.94 (C₂₂H₂₇ClN₄O); MS (ESI): 399 (M+H⁺).

25

Example 40

N-Methyl-N-[1-(4-{3-[4-(pyridin-3-yloxy)phenyl]ureido}phenyl)pyrrolidin-3-yl]acetamide



30

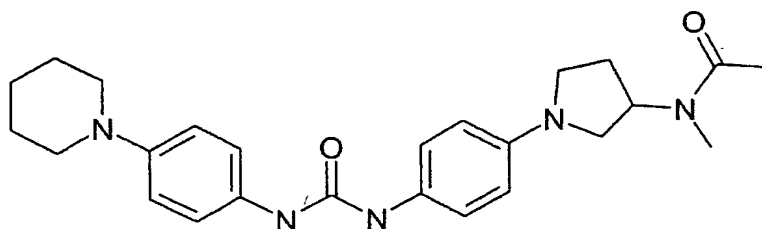
N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted with

carbonyldiimidazole and then with 4-(pyridin-3-yloxy)phenylamine by method A. This resulted in the product with the molecular weight of 445.53 (C₂₅H₂₇N₅O₃); MS (ESI): 446 (M+H⁺).

5

Example 41

N-Methyl-N-(1-{4-[3-(4-piperidin-1-ylphenyl)ureido]phenyl}pyrrolidin-3-yl)acetamide



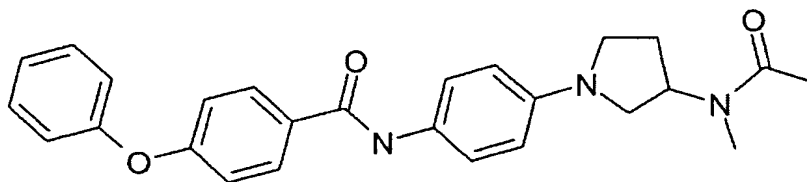
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N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted with carbonyldiimidazole and then with 4-piperidin-1-ylphenylamine by method A. This resulted in the product with the molecular weight of 435.57 (C₂₅H₃₃N₅O₂); MS (ESI): 436 (M+H⁺).

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Example 42

N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-4-phenoxybenzamide



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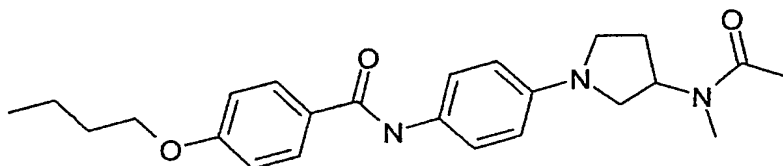
N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted with 4-phenoxybenzoic acid by method E. This resulted in the product with the molecular weight of 429.52 (C₂₆H₂₇N₃O₃); MS (ESI): 430 (M+H⁺).

25

Example 43

N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-4-butoxybenzamide

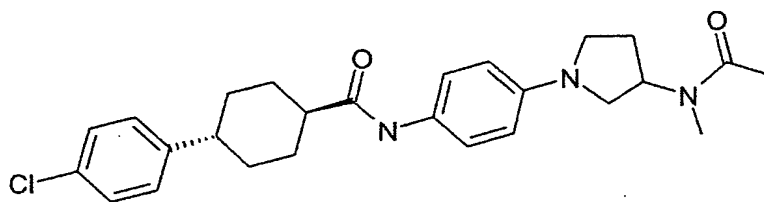
101



N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted with 4-butoxybenzoic acid by method E. This resulted in the product with the molecular weight of 409.53 (C₂₄H₃₁N₃O₃); MS (ESI): 410 (M+H⁺).

Example 44

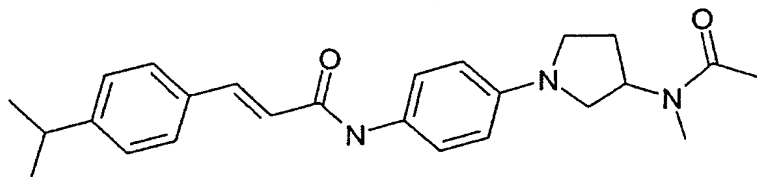
4-(4-Chlorophenyl)cyclohexanecarboxylic acid {4-[3-(acetylmethylamino)-pyrrolidin-1-yl]phenyl}amide



N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted with 4-(4-chlorophenyl)cyclohexanecarboxylic acid by method E. This resulted in the product with the molecular weight of 454.02 (C₂₆H₃₂ClN₃O₂); MS (ESI): 454 (M+H⁺).

Example 45

N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-3-(4-isopropylphenyl)-acrylamide



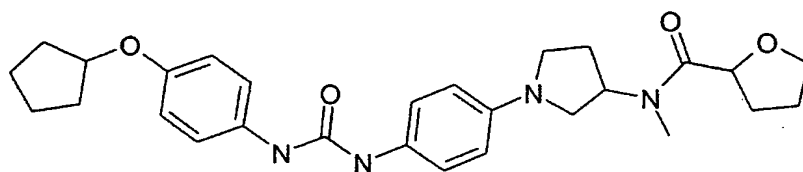
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N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted with 3-(4-isopropylphenyl)acrylic acid by method E. This resulted in the product

with the molecular weight of 405.54 (C₂₅H₃₁N₃O₂); MS (ESI): 406 (M+H⁺).

5 Example 46

Tetrahydrofuran-2-carboxylic acid (1-{4-[3-(4-cyclopentyloxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)methylamide



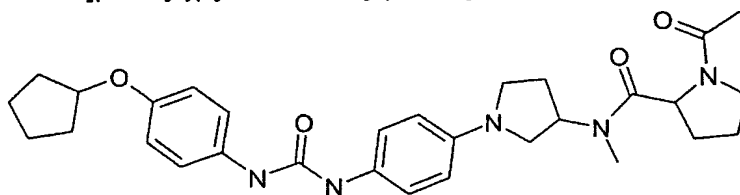
10

1-(4-Cyclopentyloxyphenyl)-3-[4-(3-methylaminopyrrolidin-1-yl)phenyl]urea was reacted with tetrahydrofuran-2-carboxylic acid by method E. This resulted in the product with the molecular weight of 492.62 (C₂₈H₃₆N₄O₄); MS (ESI): 493 (M+H⁺).

15

Example 47

1-Acetylpyrrolidin-2-carboxylic acid (1-{4-[3-(4-cyclopentyloxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)methylamide



20

1-(4-Cyclopentyloxyphenyl)-3-[4-(3-methylaminopyrrolidin-1-yl)phenyl]urea was reacted with 1-acetylpyrrolidine-2-carboxylic acid by method E. This resulted in the product with the molecular weight of 533.68 (C₃₀H₃₉N₅O₄); MS (ESI): 534 (M+H⁺).

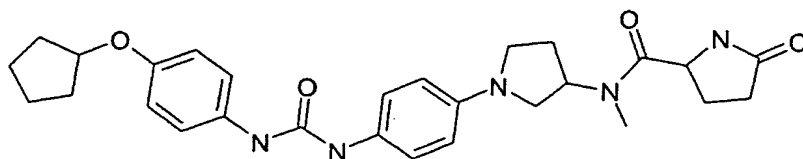
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Example 48

5-Oxopyrrolidine-2-carboxylic acid (1-{4-[3-(4-cyclopentyloxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)methylamide

30

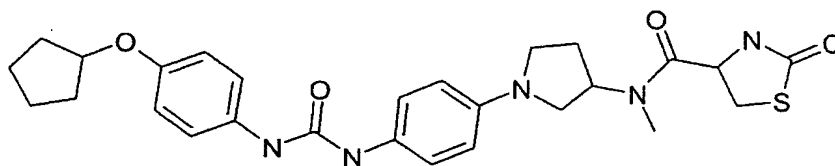
103



1-(4-Cyclopentyloxyphenyl)-3-[4-(3-methylaminopyrrolidin-1-yl)phenyl]urea
 was reacted with 5-oxopyrrolidine-2-carboxylic acid by method E. This
 5 resulted in the product with the molecular weight of 505.62 (C₂₈H₃₅N₅O₄);
 MS (ESI): 506 (M+H⁺).

Example 49

10 2-Oxothiazolidine-4-carboxylic acid (1-{4-[3-(4-cyclopentyloxyphenyl)-
 ureido]phenyl}pyrrolidin-3-yl)methylamide

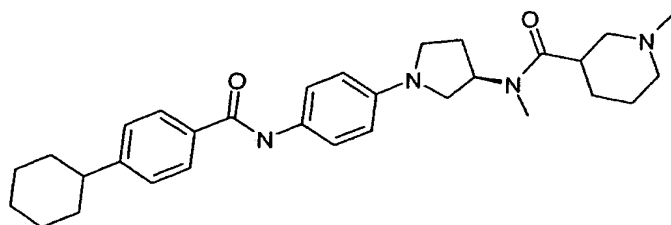


15 1-(4-Cyclopentyloxyphenyl)-3-[4-(3-methylaminopyrrolidin-1-yl)phenyl]urea
 was reacted with 2-oxothiazolidine-4-carboxylic acid by method E. This
 resulted in the product with the molecular weight of 523.66
 (C₂₇H₃₃N₅O₄S); MS (ESI): 524 (M+H⁺).

20

Example 50

(R)-1-Methylpiperidine-3-carboxylic acid {1-[4-(4-cyclohexylbenzoyl)-
 amino]phenyl}pyrrolidin-3-yl)methylamide



25

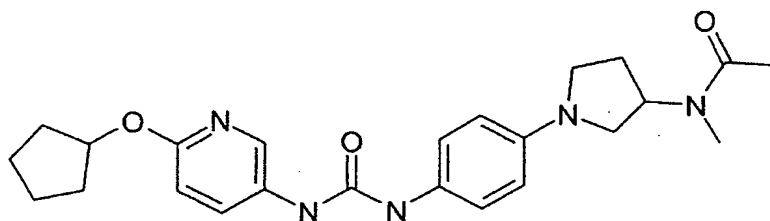
(R)-4-Cyclohexyl-N-[4-(3-methylaminopyrrolidin-1-yl)phenyl]benzamide was

reacted with 1-methylpiperidine-3-carboxylic acid by method E. This resulted in the product with the molecular weight of 502.71 (C₃₁H₄₂N₄O₂); MS (ESI): 503 (M+H⁺).

5

Example 51

N-(1-{4-[3-(6-Cyclopentyloxy)pyridin-3-yl]ureido}phenyl)pyrrolidin-3-yl)-N-methylacetamide



10

N-[1-(4-aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted with carbonyldiimidazole and then 6-cyclopentyloxy-3-pyridylamine by method A. This resulted in the product with the molecular weight of 437.55 (C₂₄H₃₁N₅O₃); MS (ESI): 438 (M+H⁺).

15

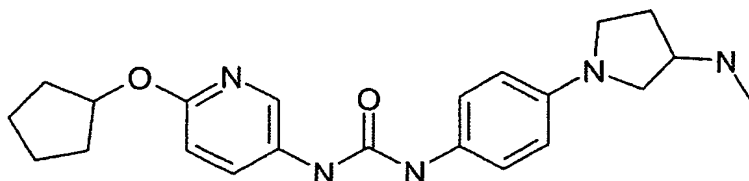
6-Cyclopentyloxy-3-pyridylamine

A mixture of 5-nitropyridin-2-ol (14.0 g), bromocyclopentane (8.0 g), potassium carbonate (14 g) and DMF (200 ml) was heated at 80°C for 6 hours. After cooling, the reaction mixture was diluted with water and extracted with ethyl acetate. The organic phase was washed with water, dried over magnesium sulfate and concentrated. The residue was purified by chromatography on silica gel. The resulting product (2-cyclopentyloxy-5-nitropyridine) was hydrogenated by method B. This resulted in the product with the molecular weight of 178.24 (C₁₀H₁₄N₂O); MS (ESI): 179 (M+H⁺).

Example 52

1-(6-Cyclopentyloxy-3-pyridyl)-3-[4-(3-methylaminopyrrolidin-1-yl)-phenyl]urea

30

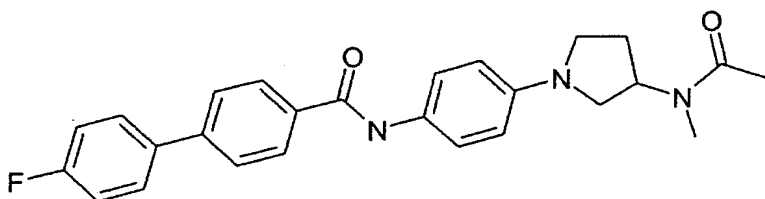


N-(1-(4-[3-(6-Cyclopentyloxy)pyridin-3-yl]ureido)phenyl)pyrrolidin-3-yl)-N-methylacetamide was treated with sodium hydroxide solution by method D.

- 5 This resulted in the product with the molecular weight of 395.51 (C₂₂H₂₉N₅O₂); MS (ESI): 395 (M+H⁺).

Example 53

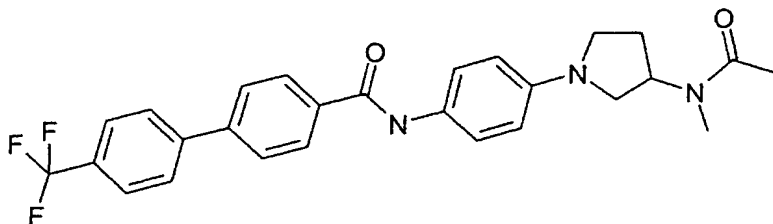
- 10 4'-Fluorobiphenyl-4-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide



- 15 N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted with 4'-fluorobiphenyl-4-carboxylic acid by method E. This resulted in the product with the molecular weight of 431.51 (C₂₆H₂₆N₃O₂); MS (ESI): 432 (M+H⁺).

Example 54

- 20 4'-Trifluoromethylbiphenyl-4-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide



- 25 N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted with 4'-trifluoromethylbiphenyl-4-carboxylic acid by method E. This resulted in

the product with the molecular weight of 481.52 (C₂₇H₂₆F₃N₃O₂); MS (ESI): 482 (M+H⁺).

5 Examples 55-103

1-(4-Phenoxyphenyl)-3-[4-(3-methylaminopyrrolidin-1-yl)phenyl]urea was reacted with various carboxylic acids by method E. The products are compiled in table 2.

10

Examples 104-144

1-(4-Cyclopentyloxyphenyl)-3-[4-(3-methylaminopyrrolidin-1-yl)phenyl]urea was reacted with various carboxylic acids by method E. The products are compiled in table 3.

15

Examples 145-185

N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted with various carboxylic acids by method E. The products are compiled in table

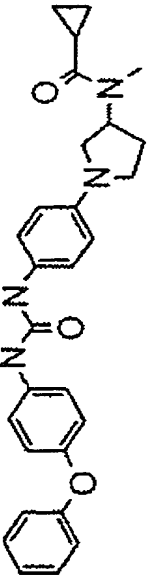
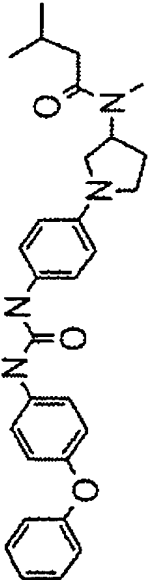
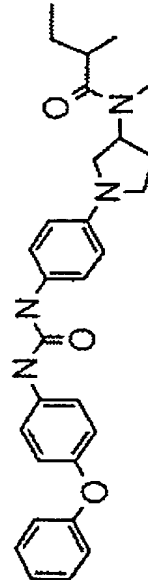
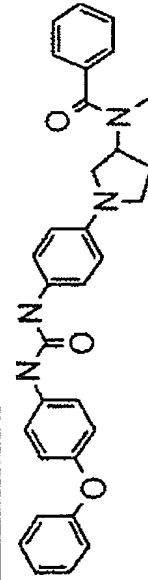
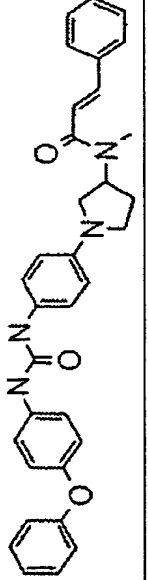
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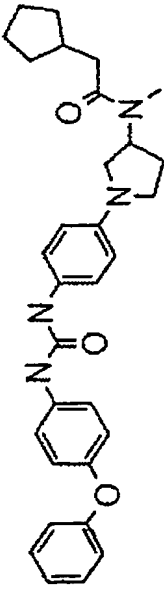
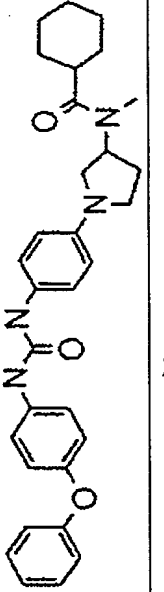
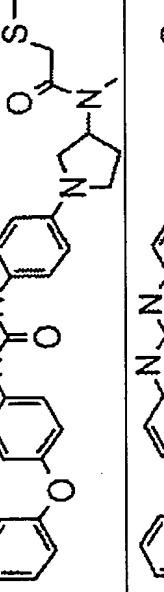
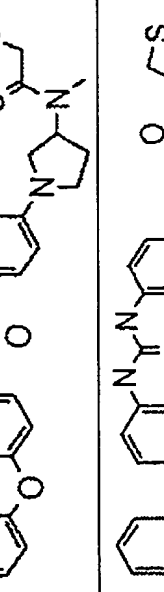
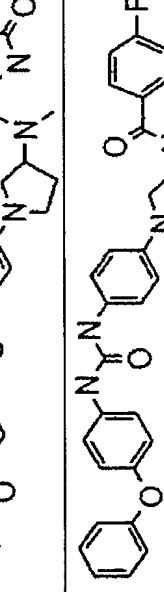
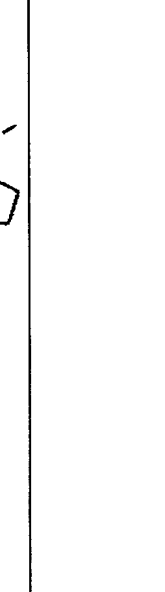
Examples 186-234

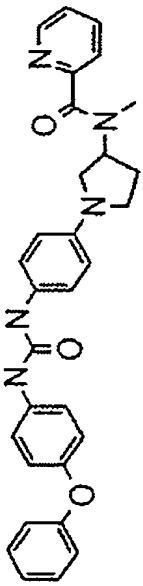
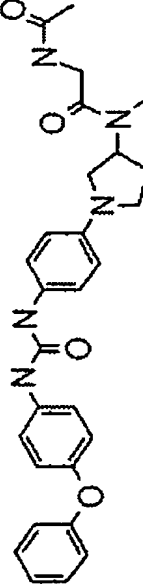
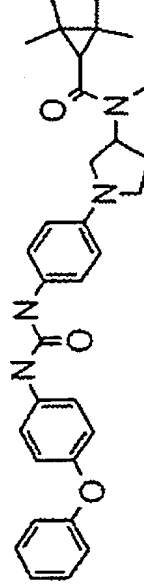
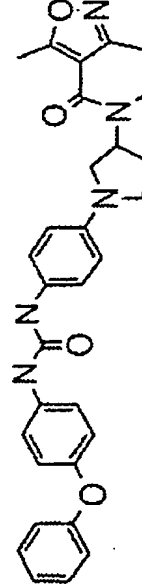
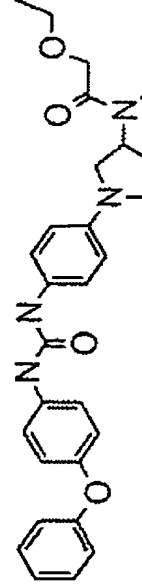
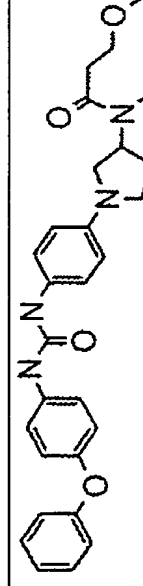
N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted with carbonyldiimidazole and then with various amines by method A. The

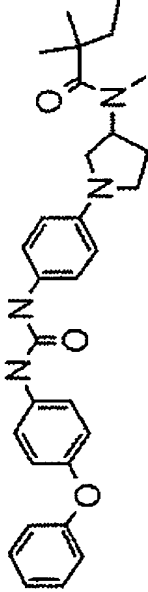
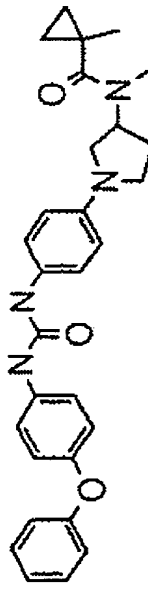
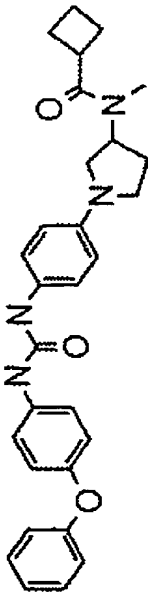
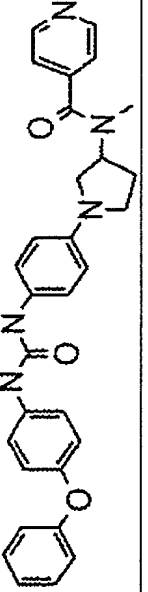
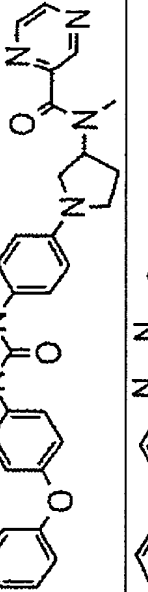
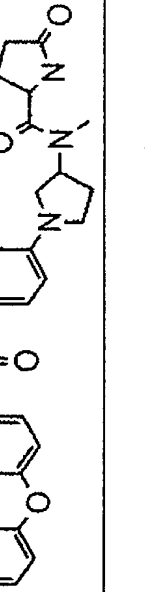
25 products are compiled in table 5.

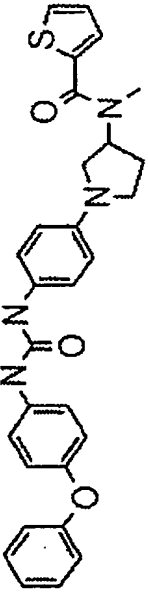
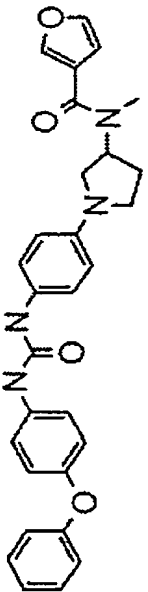
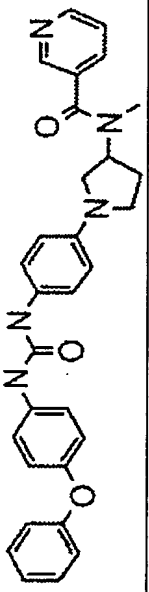
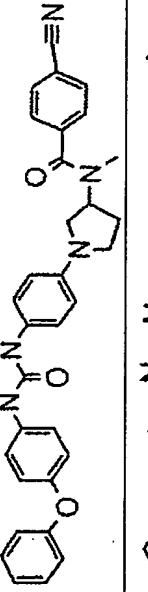
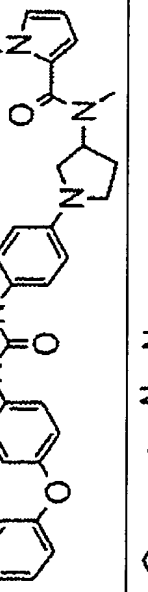
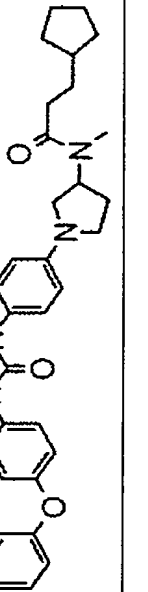
Table 2

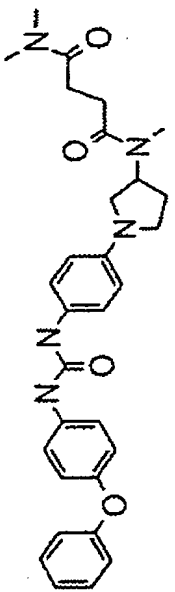
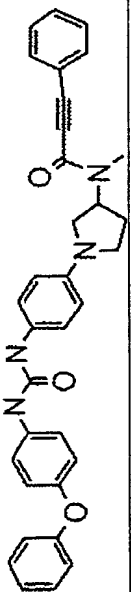
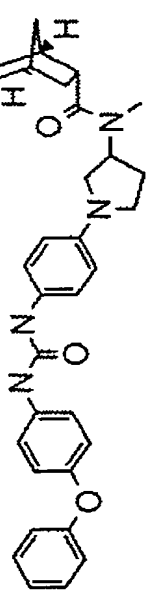
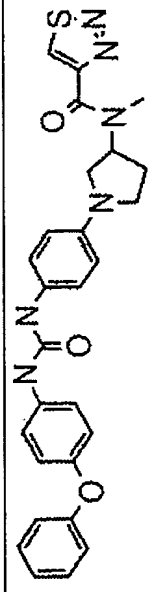
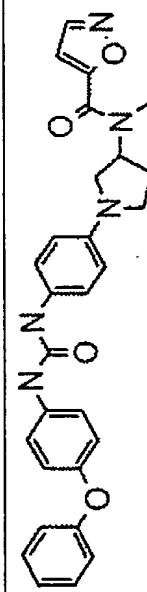
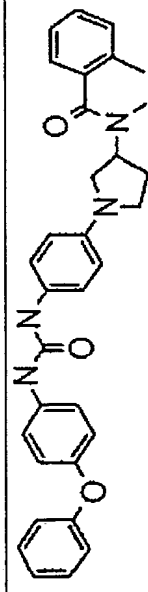
Ex. No.	Structure	Name	Molecular formula	Molecular weight	M+H+
55		Cyclopropanecarboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl)pyrrolidin-3-yl)amide	C28H30N4O3	470.58	471
56		3,N-Dimethyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl)pyrrolidin-3-yl)butyramide	C29H34N4O3	486.62	487
57		2,N-Dimethyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl)pyrrolidin-3-yl)butyramide	C29H34N4O3	486.62	487
58		N-Methyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl)pyrrolidin-3-yl)benzamide	C31H30N4O3	506.61	507
59		(E)-N-Methyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl)pyrrolidin-3-yl)-3-phenylacrylamide	C33H32N4O3	532.65	533

60		2-Cyclopentylidene-N-methyl-N-(1-{4-[3-(4-phenoxyphenyl)ureido]phenyl}pyrrolidin-3-yl)acetamide	C31H36N4O3	512.66	513
61		Cyclohexanecarboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)ureido]phenyl}pyrrolidin-3-yl)amide	C31H36N4O3	512.66	513
62		N-Methyl-2-methylsulfanyl-N-(1-{4-[3-(4-phenoxyphenyl)ureido]phenyl}pyrrolidin-3-yl)acetamide	C27H30N4O3S	490.63	491
63		N-Methoxy-N-methyl-N-(1-{4-[3-(4-phenoxyphenyl)ureido]phenyl}pyrrolidin-3-yl)acetamide	C27H30N4O4	474.56	475
64		2-Oxothiazolidine-4-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)ureido]phenyl}pyrrolidin-3-yl)amide	C28H29N5O4S	531.64	532
65		4-Fluoro-N-methyl-N-(1-{4-[3-(4-phenoxyphenyl)ureido]phenyl}pyrrolidin-3-yl)benzamide	C31H29FN4O3	524.60	525

66		Pyridine-2-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl}pyrrolidin-3-yl)amide	C30H29N5O3	507.60	508
67		2-Acetylamino-N-methyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl}pyrrolidin-3-yl)acetamide	C28H31N5O4	501.59	502
68		2,2,3,3-Tetramethylcyclopropanecarboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl}pyrrolidin-3-yl)amide	C32H38N4O3	526.68	527
69		3,5-Dimethylisoxazole-4-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl}pyrrolidin-3-yl)amide	C30H31N5O4	525.61	526
70		2-Ethoxy-N-methyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl}pyrrolidin-3-yl)acetamide	C28H32N4O4	488.59	489
71		3-Methoxy-N-methyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl}pyrrolidin-3-yl)propionamide	C28H32N4O4	488.59	489

72		2,2,N-Trimethyl-N-(1-{4-[3-(4-phenoxyphenyl)]-ureido]phenyl}pyrrolidin-3-yl)butyramide	C30H36N4O3	500.65	501
73		1-Methylcyclopropanecarboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)amide	C29H32N4O3	484.60	485
74		Cyclobutanecarboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)amide	C29H32N4O3	484.60	485
75		N-Methyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)isonicotinamide	C30H29N5O3	507.60	508
76		Pyrazine-2-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)amide	C29H28N6O3	508.58	509
77		5-Oxopyrrolidine-2-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)amide	C29H31N5O4	513.60	514

78		Thiophene-2-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)amide	C29H28N4O3S	512.64	513
79		Furan-3-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)amide	C29H28N4O4	496.57	497
80		N-Methyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)nicotinamide	C30H29N5O3	507.60	508
81		4-Cyano-N-methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)benzamide	C32H29N5O3	531.62	532
82		1-Methyl-1H-pyrrole-2-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)amide	C30H31N5O3	509.61	510
83		3-Cyclopentyl-N-methyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)propionamide	C32H38N4O3	526.68	527

84		N,N,N'-Trimethyl-N'-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl)pyrrolidin-3-yl)succinamide	C30H35N5O4	529.64	530
85		3-Phenylpropynoic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl)pyrrolidin-3-yl)amide	C33H30N4O3	530.63	531
86		(1R,4S)-Bicyclo[2.2.1]heptane-2-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl)pyrrolidin-3-yl)amide	C32H36N4O3	524.67	525
87		[1,2,3]Thiadiazole-4-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl)pyrrolidin-3-yl)amide	C27H26N6O3S	514.61	515
88		Isoxazole-5-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl)pyrrolidin-3-yl)amide	C28H27N5O4	497.56	498
89		2,N-Dimethyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl)pyrrolidin-3-yl)benzamide	C32H32N4O3	520.64	521

90		2-Methanesulfonyl-N-methyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)-acetamide	C27H30N4O5S	522.63	523
91		(E)-N-Methyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)-3-pyridin-3-ylacrylamide	C32H31N5O3	533.64	534
92		4,4,4-Trifluoro-N-methyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)butyramide	C28H29F3N4O3	526.56	527
93		2-Dimethylamino-N-methyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)acetamide	C28H33N5O3	487.61	488
94		3-Acetylamino-N-methyl-N-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)propionamide	C29H33N5O4	515.62	516
95		Tetrahydrofuran-2-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido]phenyl}pyrrolidin-3-yl)-amide	C29H32N4O4	500.60	501

96		N-Methyl-2-(3-methylisoxazol-5-yl)-N-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl}pyrrolidin-3-yl)-acetamide	C30H31N5O4	525.61	526
97		(S)-1-Acetylpyrrolidine-2-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl}pyrrolidin-3-yl)amide	C31H35N5O4	541.66	542
98		4-Methyl-[1,2,3]thiadiazole-5-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl}pyrrolidin-3-yl)amide	C28H28N6O3S	528.64	529
99		1,5-Dimethyl-1H-pyrazole-3-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl}pyrrolidin-3-yl)amide	C30H32N6O3	524.63	525
100		5-Methylhexanoic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl}pyrrolidin-3-yl)amide	C31H38N4O3	514.67	515
101		Tetrahydropyran-4-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)]ureido}phenyl}pyrrolidin-3-yl)amide	C30H34N4O4	514.63	515

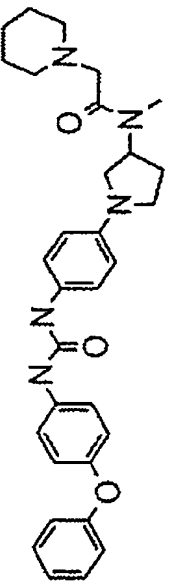
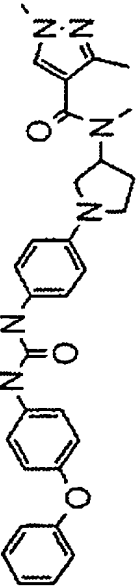
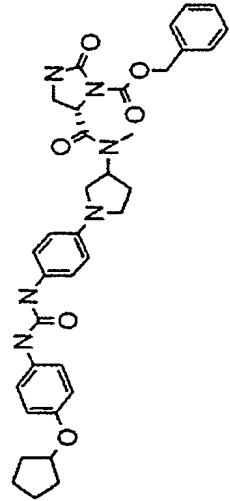
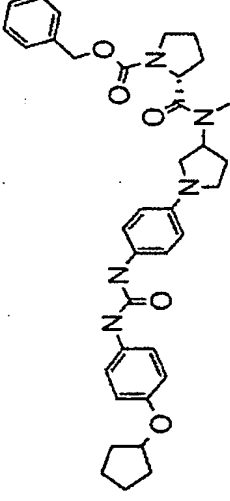
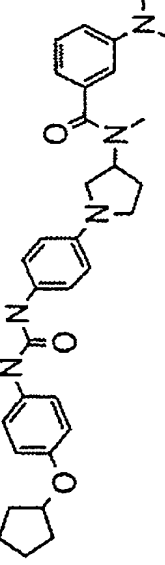
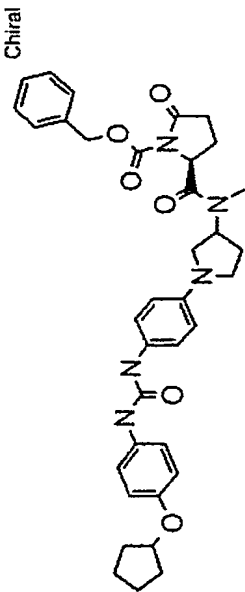
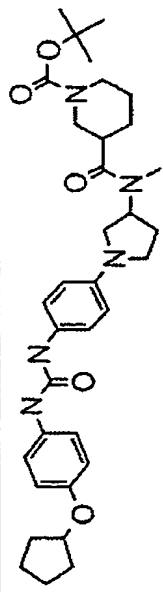
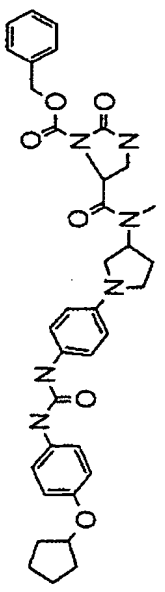
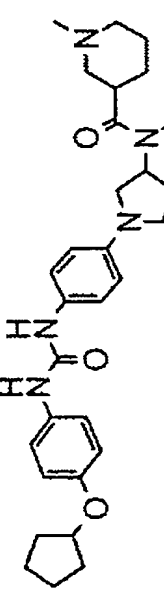
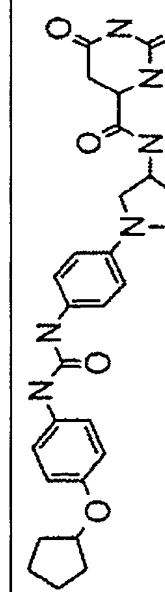
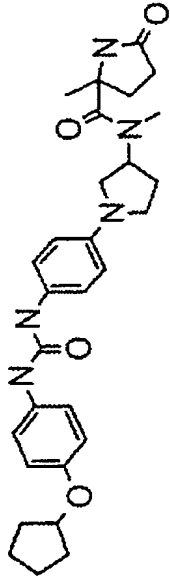
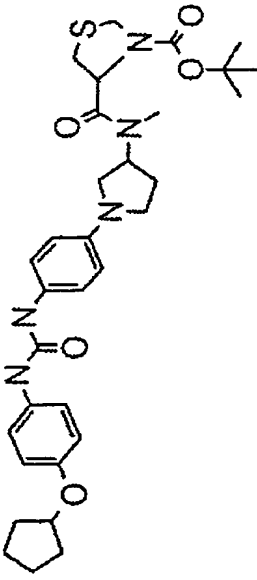
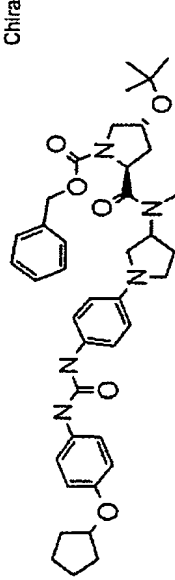
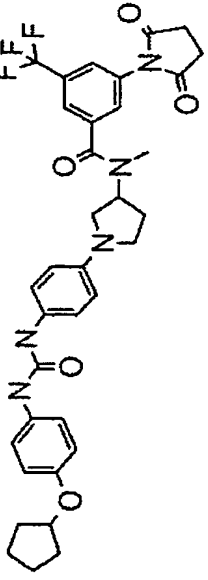
102		N-Methyl-N-(1-{4-[3-(4-phenoxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)-2-piperidin-1-ylacetamide	C31H37N5O3	527.67	528
103		1,3-Dimethyl-1H-pyrazole-4-carboxylic acid methyl-(1-{4-[3-(4-phenoxyphenyl)ureido]phenyl}pyrrolidin-3-yl)amide	C30H32N6O3	524.63	525

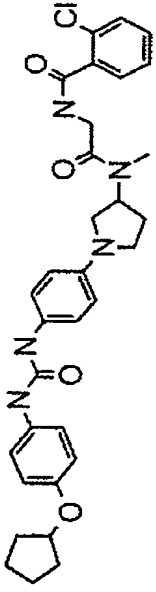
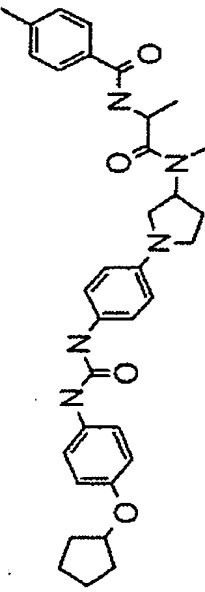
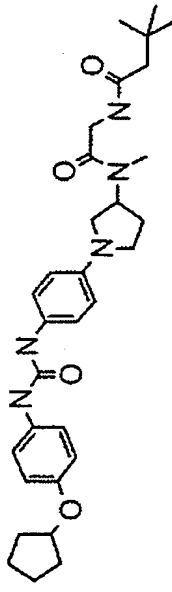
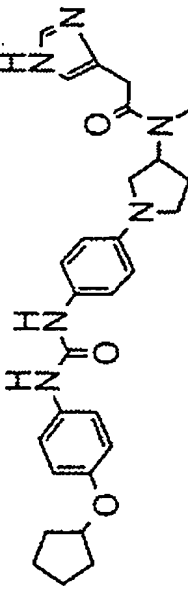
Table 3

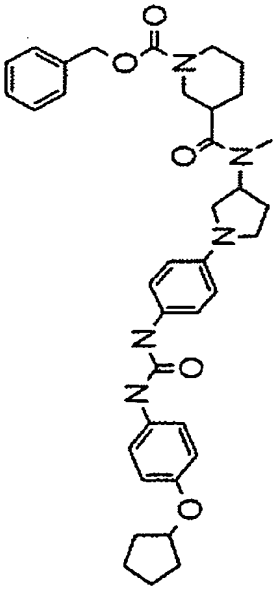
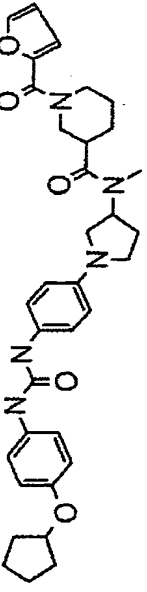
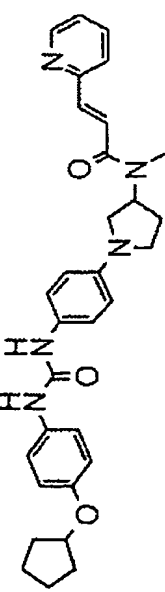
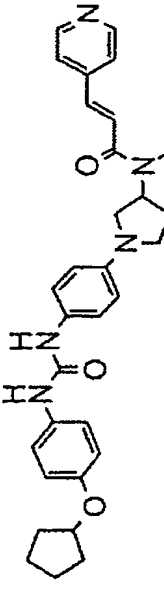
Ex. No.	Structure	Name	Molecular formula	Molecular weight	M+H+
104	<p>Chiral</p> 	Benzyl (S)-5-[(1-{4-[3-(4-cyclopentylloxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)methylcarbamoyl]-2-oxoimidazolidine-1-carboxylate	C ₃₅ H ₄₀ N ₆ O ₆	640.75	641
105	<p>Chiral</p> 	Benzyl (R)-2-[(1-{4-[3-(4-cyclopentylloxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)methylcarbamoyl]-pyrrolidine-1-carboxylate	C ₃₆ H ₄₃ N ₅ O ₅	625.77	626
106		N-(1-{4-[3-(4-cyclopentylloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)-3-dimethylamino-N-methylbenzamide	C ₃₂ H ₃₉ N ₅ O ₃	541.70	542

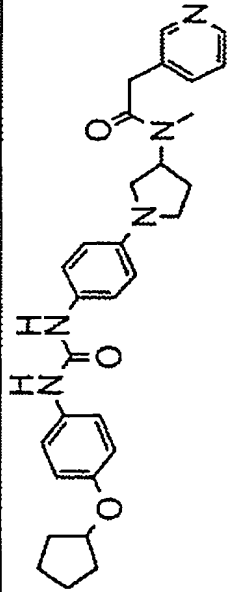
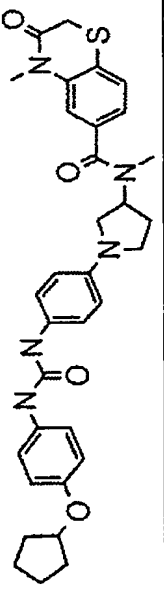
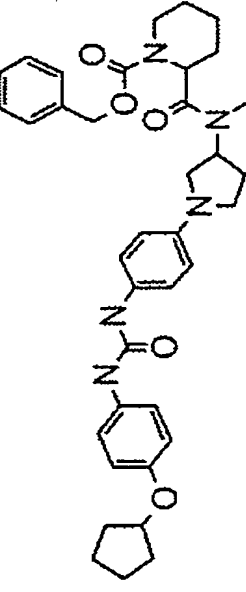
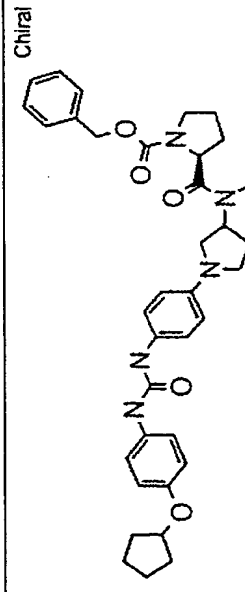
107		Benzyl (S)-2-[(1-{4-[3-(4-cyclopentylloxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)methylcarbamoyl]-5-oxopyrrolidine-1-carboxylate	C36H41N5O6	639.76	640
108		tert-Butyl 3-[(1-{4-[3-(4-cyclopentylloxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)methylcarbamoyl]piperidine-1-carboxylate	C34H47N5O5	605.78	606
109		Benzyl 5-[(1-{4-[3-(4-cyclopentylloxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)methylcarbamoyl]-2-oximidazolidine-1-carboxylate	C35H40N6O6	640.75	641
110		1-Methylpiperidine-3-carboxylic acid (1-{4-[3-(4-cyclopentylloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)methylamide	C30H41N5O3	519.69	520
111		2,6-Dioxohexahydropyrimidine-4-carboxylic acid (1-{4-[3-(4-cyclopentylloxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)methylamide	C28H34N6O5	534.62	535

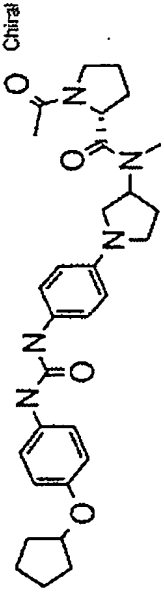
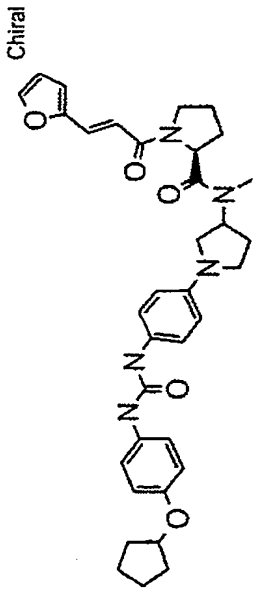
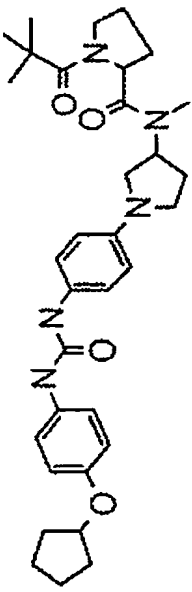
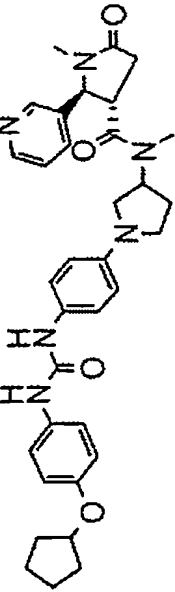
112		2-Methyl-5-oxopyrrolidine-2-carboxylic acid (1-{4-[3-(4-cyclopentylloxyphenyl)ureido]phenyl}-pyrrolidin-3-yl)methylamide	C29H37N5O4	519.65	520
113		tert-Butyl 4-[(1-{4-[3-(4-cyclopentylloxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)methylcarbamoyl]-thiazolidine-3-carboxylate	C32H43N5O5S	609.79	610
114	 Chiral	Benzyl (2S,4R)-4-tert-butoxy-2-[(1-{4-[3-(4-cyclopentylloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)methylcarbamoyl]pyrrolidine-1-carboxylate	C40H51N5O6	697.88	698
115		N-(1-{4-[3-(4-Cyclopentylloxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)-3-(2,5-dioxopyrrolidin-1-yl)-N-methyl-5-trifluoromethylbenzamide	C35H36F3N5O5	663.70	664

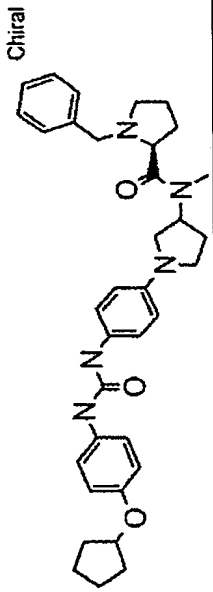
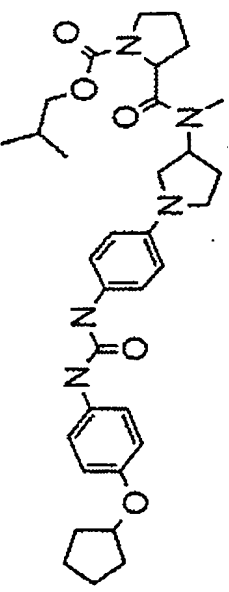
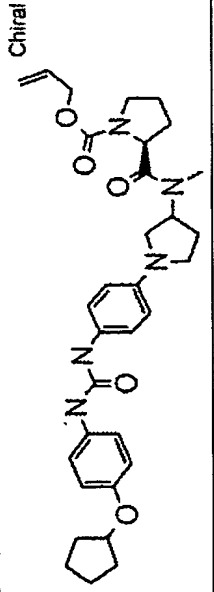
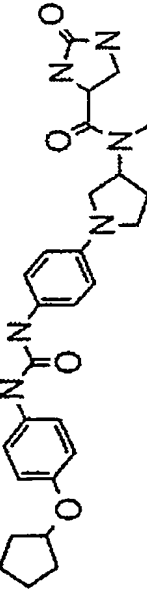
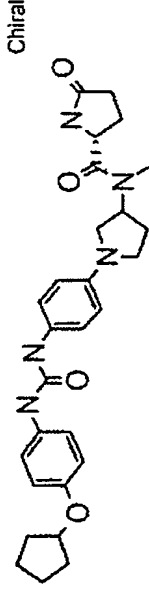
116		tert-Butyl 2-[(1-{4-[3-(4-cyclopentylloxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)methylcarbamoyl]-morpholine-4-carboxylate	C33H45N5O6	607.76	608
117		(R)-1-(Toluene-4-sulfonyl)pyrrolidine-2-carboxylic acid (1-{4-[3-(4-cyclopentylloxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)methylamide	C35H43N5O5S	645.83	646
118		((3aS,6aS)-2-[(1-{4-[3-(4-cyclopentylloxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)methylcarbamoyl]-hexahydrocyclopenta[b]pyrrol-1-yl)oxoacetic acid methyl ester	C34H43N5O6	617.75	618
119		(S)-1-(2,2,2-Trifluoroacetyl)pyrrolidine-2-carboxylic acid (1-{4-[3-(4-cyclopentylloxyphenyl)ureido]-phenyl}pyrrolidin-3-yl)methylamide	C30H36F3N5O4	587.65	588

120		2-Chloro-N-(((1-{4-[3-(4-cyclopentylloxyphenyl)-ureido]phenyl}pyrrolidin-3-yl)methyl)carbamoyl)-methyl)benzamide	C32H36ClN5O4	590.13	590
121		N-{1-[(1-{4-[3-(4-cyclopentylloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)methyl]carbamoyl}ethyl)-4-methylbenzamide	C34H41N5O4	583.74	584
122		N-(((1-{4-[3-(4-cyclopentylloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)methyl)carbamoyl)methyl)-3,3-dimethylbutyramide	C31H43N5O4	549.72	550
123		N-(1-{4-[3-(4-cyclopentylloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)-2-(1H-imidazol-4-yl)-N-methylacetamide	C28H34N6O3	502.62	503

124		Benzyl 3-[(1-{4-[3-(4-cyclopentylloxyphenyl)ureido]-phenyl}pyrrolidin-3-yl)methylcarbamoyl]piperidine-1-carboxylate	C37H45N5O5	639.80	640
125		1-(Furan-2-carbonyl)piperidine-3-carboxylic acid (1-{4-[3-(4-cyclopentylloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)methylamide	C34H41N5O5	599.74	600
126		(E)-N-(1-{4-[3-(4-Cyclopentylloxyphenyl)ureido]-phenyl}pyrrolidin-3-yl)-N-methyl-3-pyridin-2-ylacrylamide	C31H35N5O3	525.66	526
127		(E)-N-(1-{4-[3-(4-Cyclopentylloxyphenyl)ureido]-phenyl}pyrrolidin-3-yl)-N-methyl-3-pyridin-4-ylacrylamide	C31H35N5O3	525.66	526

128		N-(1-(4-[3-(4-Cyclopentylloxyphenyl)ureido]phenyl)-pyrrolidin-3-yl)-N-methyl-2-pyridin-3-ylacetamide	C30H35N5O3	513.65	514
129		4-Methyl-3-oxo-3,4-dihydro-2H-benzo[1,4]thiazine-6-carboxylic acid (1-(4-[3-(4-cyclopentylloxyphenyl)ureido]phenyl)pyrrolidin-3-yl)methylamide	C33H37N5O4S	599.76	600
130		Benzyl 2-[(1-(4-[3-(4-cyclopentylloxyphenyl)ureido]phenyl)pyrrolidin-3-yl)methyl]carbamoyl]piperidin-1-carboxylate	C37H45N5O5	639.80	640
131		Benzyl (S)-2-[(1-(4-[3-(4-cyclopentylloxyphenyl)ureido]phenyl)pyrrolidin-3-yl)methyl]carbamoyl]piperidin-1-carboxylate	C36H43N5O5	625.77	626

132		(R)-1-Acetylpyrrolidine-2-carboxylic acid (1-{4-[3-(4-cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)methylamide	C30H39N5O4	533.68	534
133		(S)-1-((E)-3-Furan-2-ylacryloyl)pyrrolidine-2-carboxylic acid (1-{4-[3-(4-cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)methylamide	C35H41N5O5	611.75	612
134		1-(2,2-Dimethylpropionyl)pyrrolidine-2-carboxylic acid (1-{4-[3-(4-cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)methylamide	C33H45N5O4	575.76	576
135		(trans)-1-Methyl-5-oxo-2-pyridin-3-ylpyrrolidine-3-carboxylic acid (1-{4-[3-(4-cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)methylamide	C34H40N6O4	596.74	597

136	 <p>Chiral</p>	(S)-1-Benzylpyrrolidine-2-carboxylic acid (1-{4-[3-(4-cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)methylamide	C35H43N5O3	581.76	582
137		Isobutyl 2-[(1-{4-[3-(4-cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)methylcarbamoyl]pyrrolidine-1-carboxylate	C33H45N5O5	591.76	592
138	 <p>Chiral</p>	Allyl (S)-2-[(1-{4-[3-(4-cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)methylcarbamoyl]pyrrolidine-1-carboxylate	C32H41N5O5	575.71	576
139		2-Oxoimidazolidine-4-carboxylic acid (1-{4-[3-(4-cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)methylamide	C27H34N6O4	506.61	507
140	 <p>Chiral</p>	(R)-5-Oxopyrrolidine-2-carboxylic acid (1-{4-[3-(4-cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)methylamide	C28H35N5O4	505.62	506

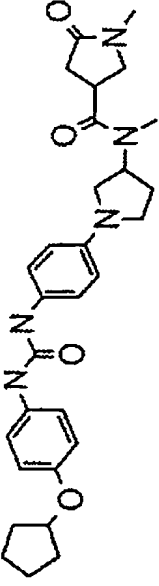
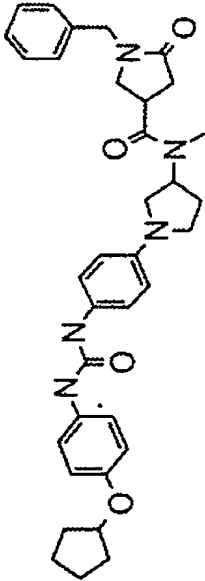
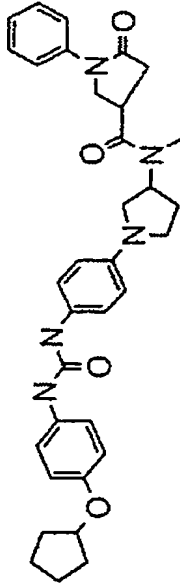
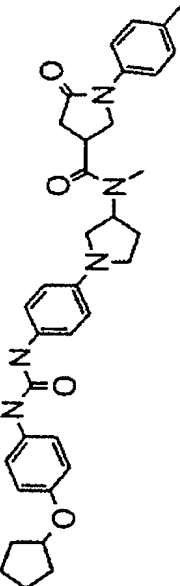
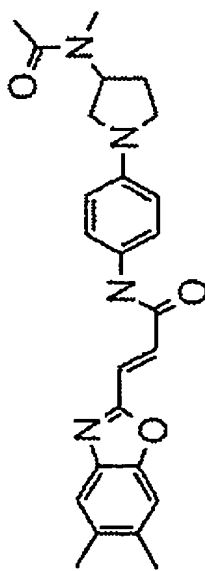
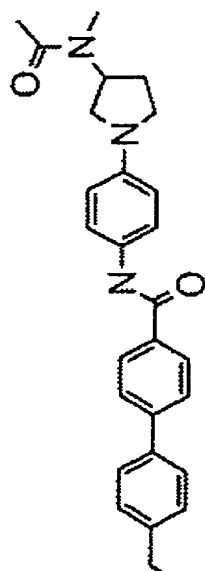
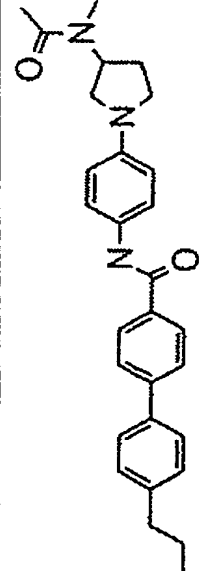
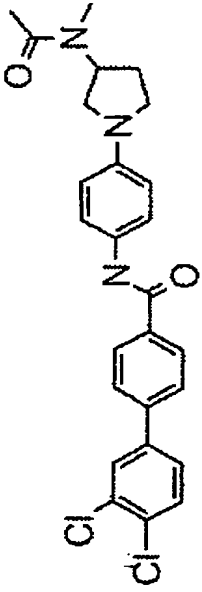
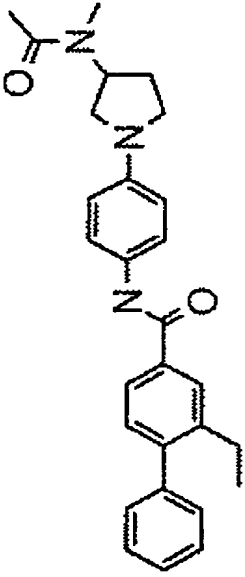
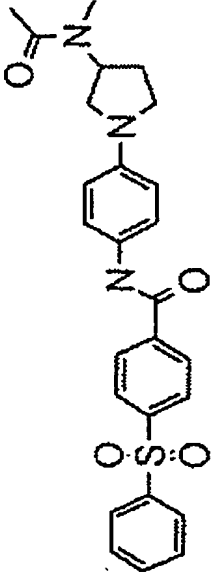
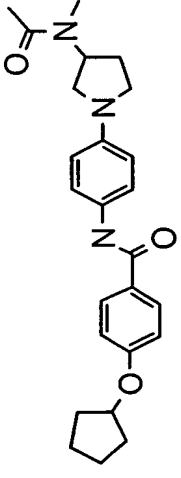
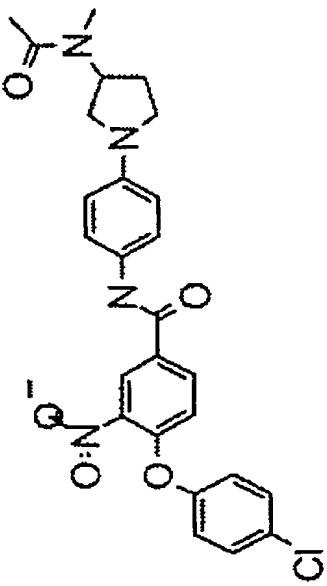
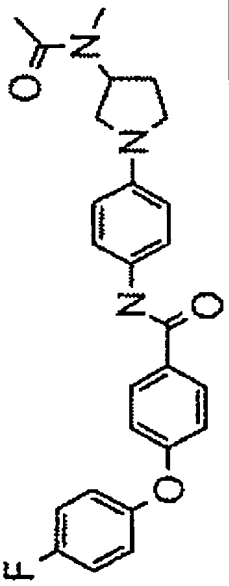
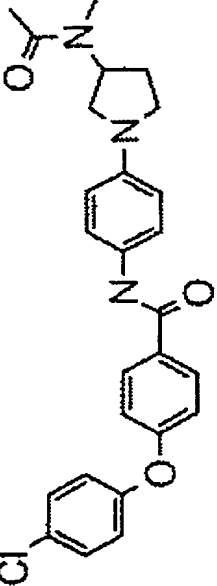
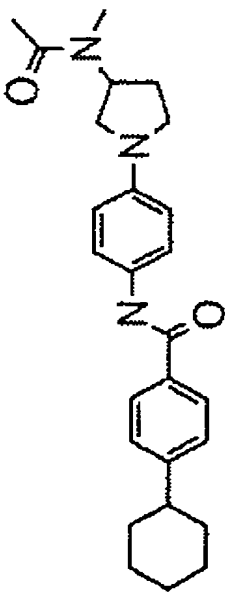
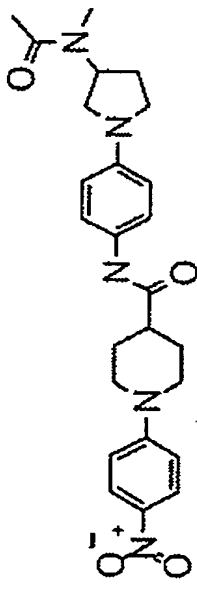
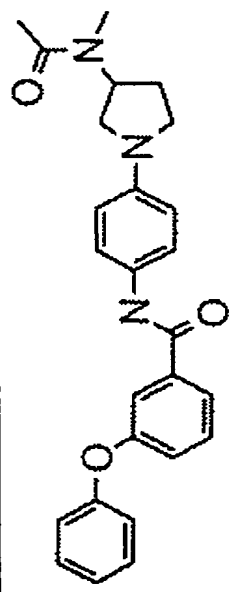
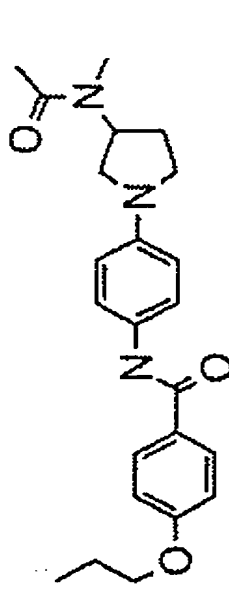
141		1-Methyl-5-oxopyrrolidine-3-carboxylic acid (1-{4-[3-(4-cyclopentyloxyphenyl)ureido]phenyl}-pyrrolidin-3-yl)methylamide	C29H37N5O4	519.65	520
142		1-Benzyl-5-oxopyrrolidine-3-carboxylic acid (1-{4-[3-(4-cyclopentyloxyphenyl)ureido]phenyl}-pyrrolidin-3-yl)methylamide	C35H41N5O4	595.75	596
143		5-Oxo-1-phenylpyrrolidine-3-carboxylic acid (1-{4-[3-(4-cyclopentyloxyphenyl)ureido]phenyl}-pyrrolidin-3-yl)methylamide	C34H39N5O4	581.72	582
144		5-Oxo-1-p-tolylpyrrolidine-3-carboxylic acid (1-{4-[3-(4-cyclopentyloxyphenyl)ureido]phenyl}-pyrrolidin-3-yl)methylamide	C35H41N5O4	595.75	596

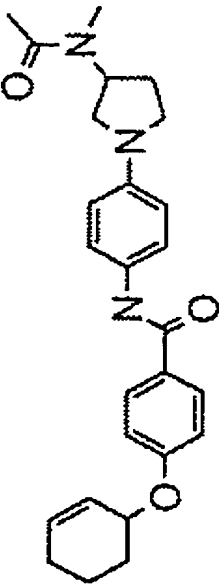
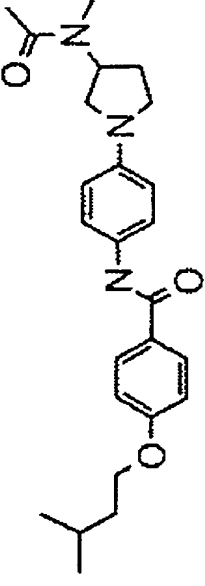
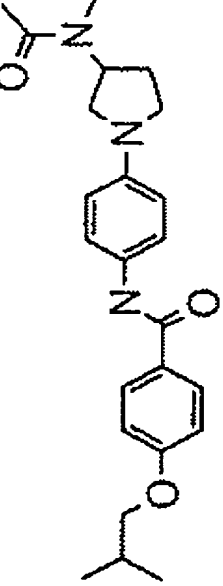
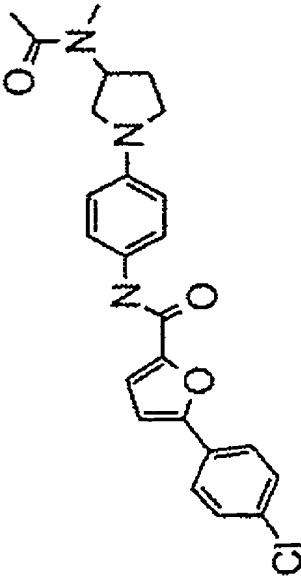
Table 4

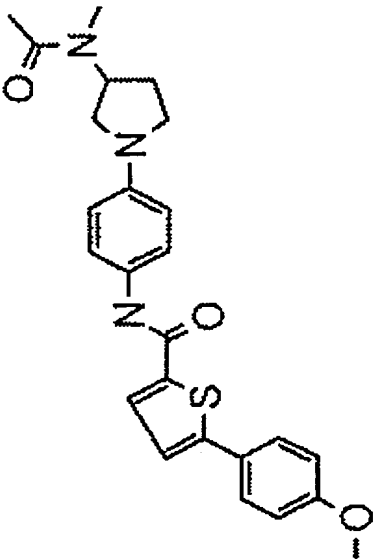
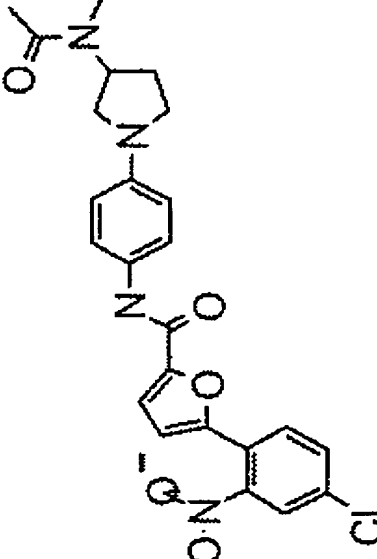
Ex. No.	Structure	Name	Molecular formula	Molecular weight	M+H+
145		(E)-N-(4-[3-(Acetylmethylamino)pyrrolidin-1-yl]-phenyl)-3-(5,6-dimethylbenzoxazol-2-yl)-acrylamide	C ₂₅ H ₂₈ N ₄ O ₃	432.53	433
146		4'-Ethylbiphenyl-4-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C ₂₈ H ₃₁ N ₃ O ₂	441.58	442
147		4'-Propylbiphenyl-4-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C ₂₉ H ₃₃ N ₃ O ₂	455.61	456

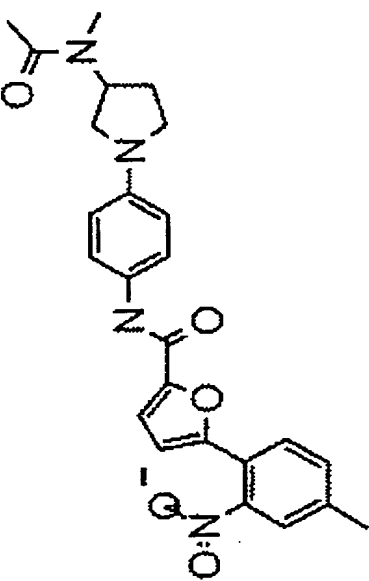
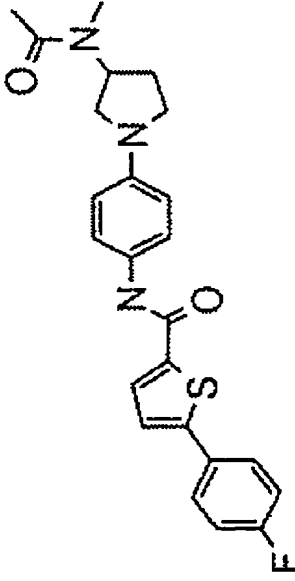
152		3,4'-Dichlorobiphenyl-4-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C26H25Cl2N3O2	482.41	482
153		2-Ethylbiphenyl-4-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C28H31N3O2	441.58	442
154		N-(4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl)-4-benzenesulfonylbenzamide	C26H27N3O4S	477.59	478
155		N-(4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl)-4-cyclopentyloxybenzamide	C25H31N3O3	421.54	422

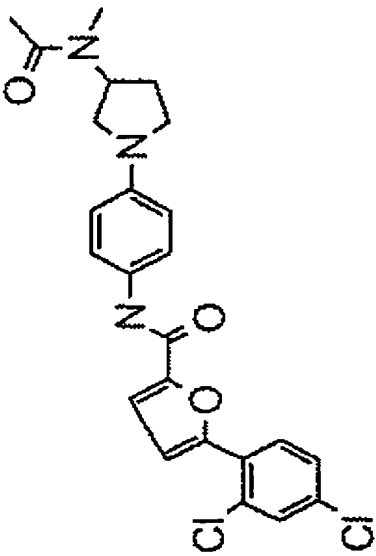
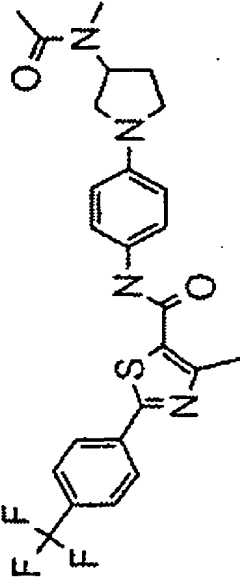
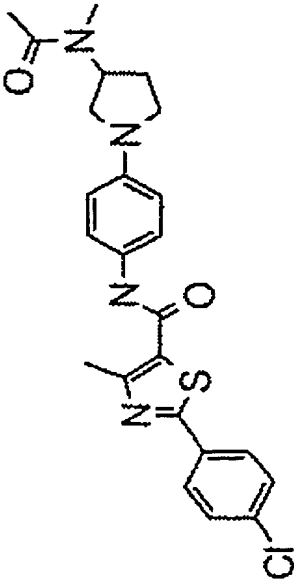
156		N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-4-(4-chlorophenoxy)-3-nitrobenzamide	C26H25ClN4O5	508.97	509
157		N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-4-(4-fluorophenoxy)benzamide	C26H26FN3O3	447.51	448
158		N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-4-(4-chlorophenoxy)benzamide	C26H26ClN3O3	463.97	464

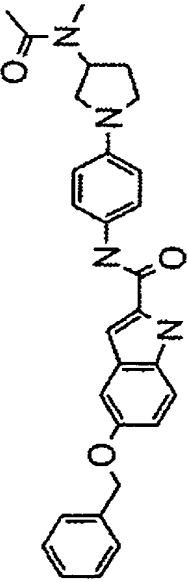
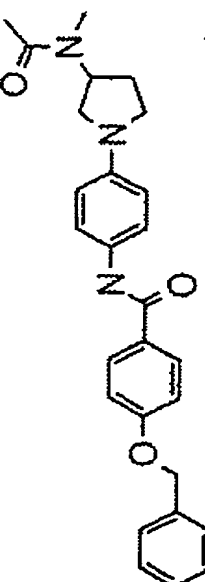
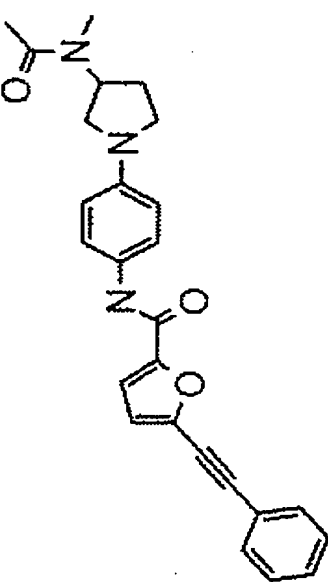
159		N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-4-cyclohexylbenzamide	C26H33N3O2	419.57	420
160		1-(4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl)-4-(4-nitrophenyl)piperidine-4-carboxylic acid	C25H31N5O4	465.56	466
161		N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-3-phenoxybenzamide	C26H27N3O3	429.52	430
162		N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-4-propoxybenzamide	C23H29N3O3	395.51	396

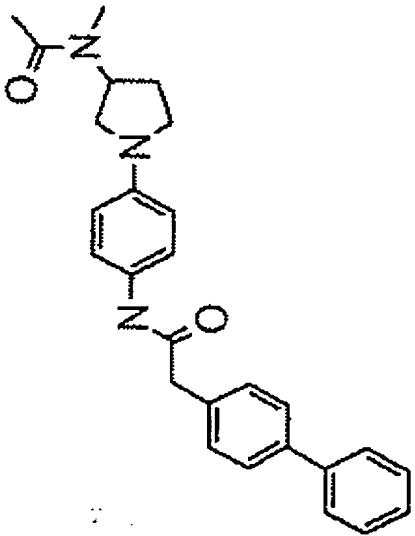
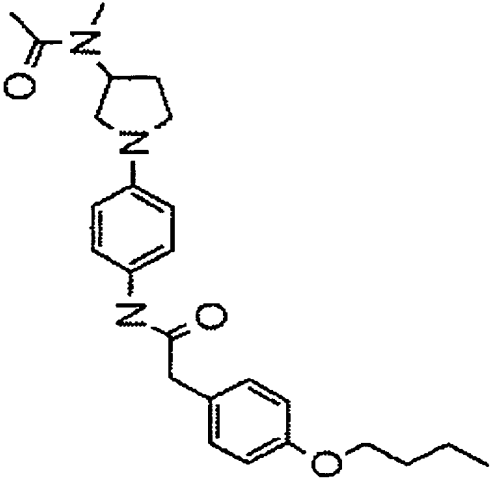
163		N-(4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl)-4-(cyclohex-2-enyloxy)benzamide	C26H31N3O3	433.56	434
164		N-(4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl)-4-(3-methylbutoxy)benzamide	C25H33N3O3	423.56	424
165		N-(4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl)-4-isobutoxybenzamide	C24H31N3O3	409.53	410
166		5-(4-Chlorophenyl)furan-2-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C24H24ClN3O3	437.93	438

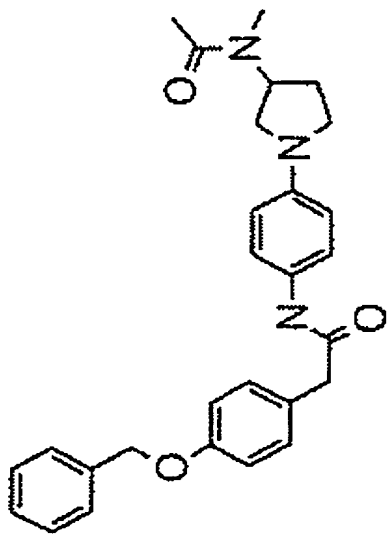
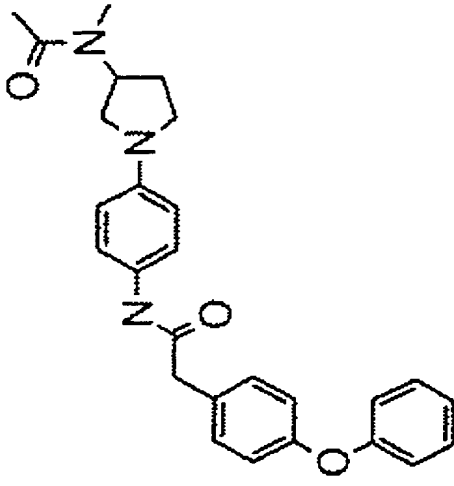
167		5-(4-Methoxyphenyl)thiophene-2-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}- amide	C25H27N3O3S	449.58	450
168		5-(4-Chloro-2-nitrophenyl)furan-2-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}- amide	C24H23ClN4O5	482.93	483

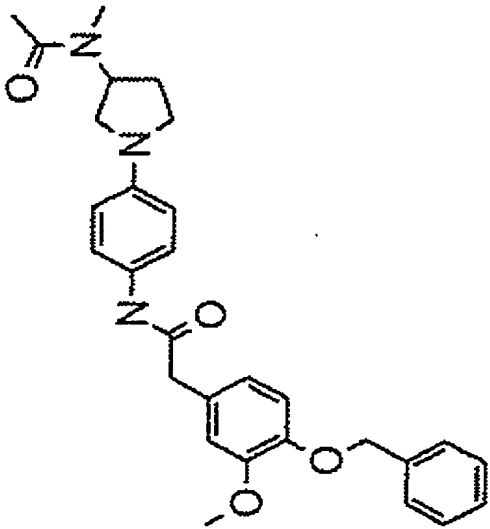
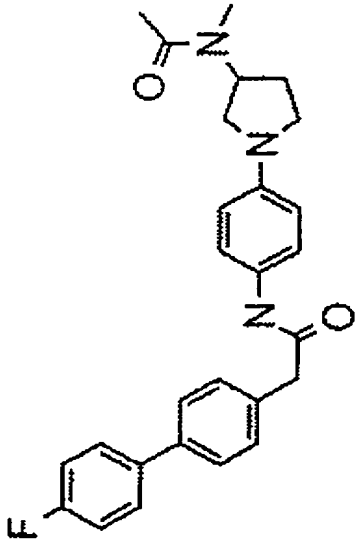
169		5-(4-Methyl-2-nitrophenyl)furan-2-carboxylic acid {4-[3-(acetyl(methylamino)pyrrolidin-1-yl)]phenyl}- amide	C25H26N4O5	462.51	463
170		5-(4-Fluorophenyl)thiophene-2-carboxylic acid {4-[3-(acetyl(methylamino)pyrrolidin-1-yl)]phenyl}- amide	C24H24FN3O2S	437.54	438

171		5-(2,4-Dichlorophenyl)furan-2-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C24H23Cl2N3O3	472.38	472
172		4-Methyl-2-(4-(trifluoromethyl)phenyl)thiazole-5-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C25H25F3N4O2 S	502.56	503
173		2-(4-Chlorophenyl)-4-methylthiazole-5-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C24H25ClN4O2S	469.01	469

174		5-Benzyloxy-1H-indole-2-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C29H30N4O3	482.59	483
175		N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-4-benzyloxybenzamide	C27H29N3O3	443.55	444
176		5-Phenylethynylfuran-2-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C26H25N3O3	427.51	428

177		N-[4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl]-2-biphenyl-4-ylacetamide	C27H29N3O2	427.55	428
178		N-[4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl]-2-(4-butoxyphenyl)acetamide	C25H33N3O3	423.56	424

179		N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-2-(4-benzoyloxyphenyl)acetamide	C28H31N3O3	457.58	458
180		N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-2-(4-phenoxyphenyl)acetamide	C27H29N3O3	443.55	444

181		N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}- 2-(4-benzyloxy-3-methoxyphenyl)acetamide	C29H33N3O4	487.60	488
182		N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}- 2-(4'-fluorobiphenyl-4-yl)acetamide	C27H28FN3O2	445.54	446

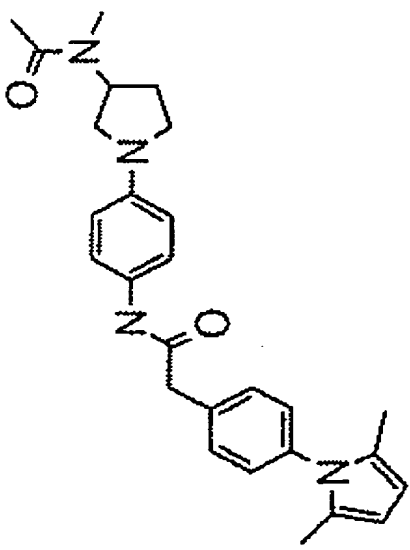
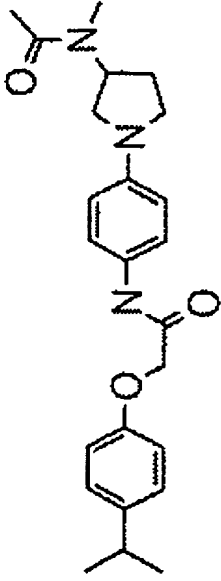
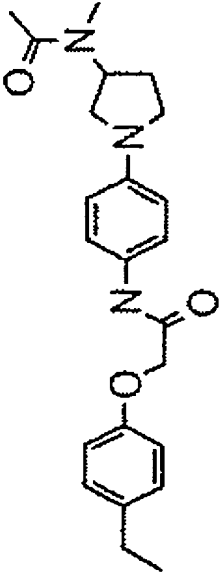
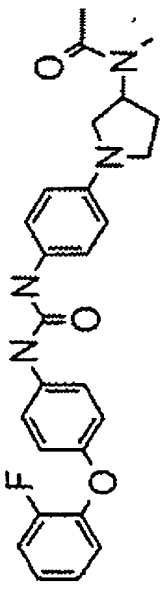
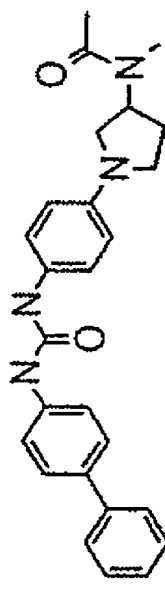
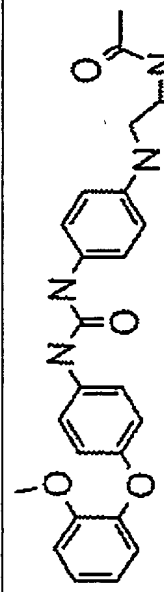
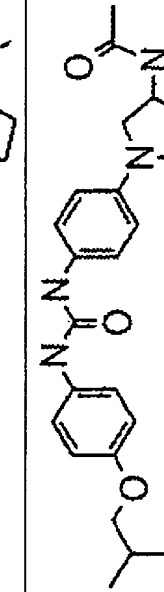
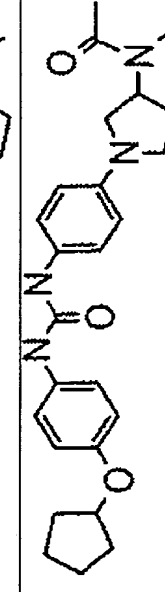
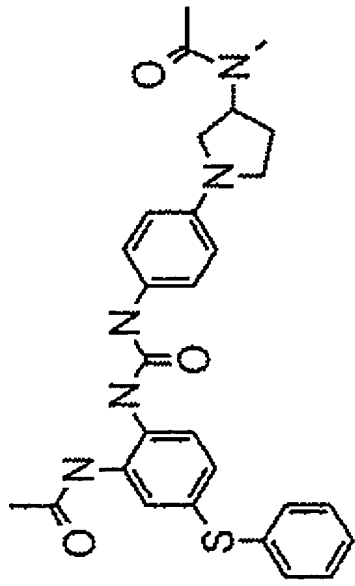
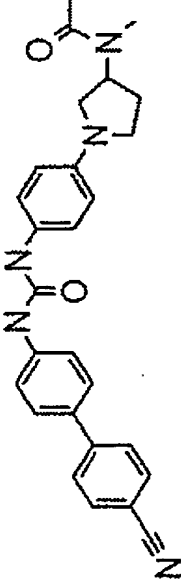
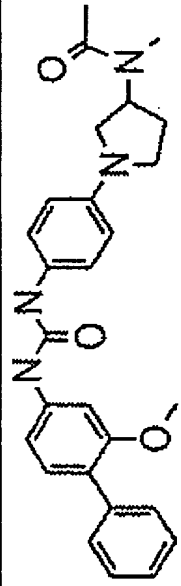
183		N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}- 2-[4-(2,5-dimethylpyrrol-1-yl)phenyl]acetamide	C27H32N4O2	444.58	445
184		N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}- 2-(4-isopropoxyphenyl)acetamide	C24H31N3O3	409.53	410
185		N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}- 2-(4-ethylphenoxy)acetamide	C23H29N3O3	395.51	396

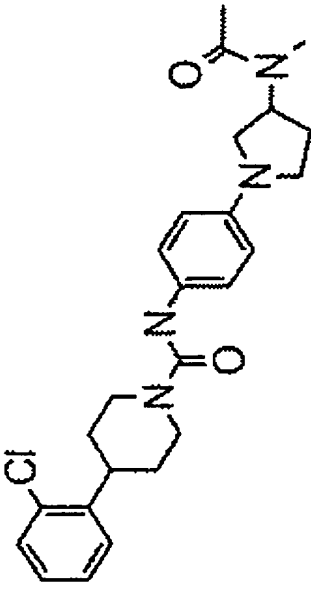
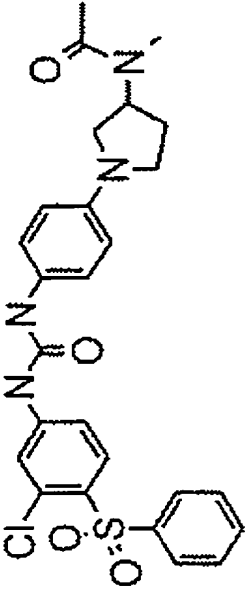
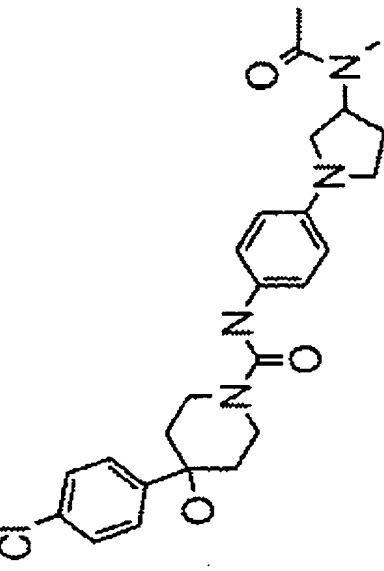
Table 5

Ex. No.	Structure	Name	Molecular formula	Molecular weight	M+H+
186		N-Methyl-N-[1-(4-{3-(6-phenoxy)pyridin-3-yl}ureido)phenyl]pyrrolidin-3-yl]acetamide	C ₂₅ H ₂₇ N ₅ O ₃	445.53	446
187		N-[1-(4-{3-[4-(2-Chlorophenoxy)phenyl]ureido}phenyl)pyrrolidin-3-yl]-N-methylacetamide	C ₂₆ H ₂₇ ClN ₄ O ₃	478.98	479
188		N-[1-(4-{3-[4-(3-Chlorophenoxy)phenyl]ureido}phenyl)pyrrolidin-3-yl]-N-methylacetamide	C ₂₆ H ₂₇ ClN ₄ O ₃	478.98	479
189		N-Methyl-N-[1-(4-{3-(4-o-tolylloxyphenyl)ureido}phenyl)pyrrolidin-3-yl]acetamide	C ₂₇ H ₃₀ N ₄ O ₃	458.57	459
190		N-Methyl-N-[1-(4-{3-(4-m-tolylloxyphenyl)ureido}phenyl)pyrrolidin-3-yl]acetamide	C ₂₇ H ₃₀ N ₄ O ₃	458.57	459

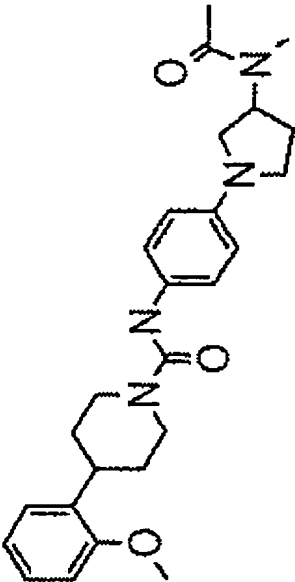
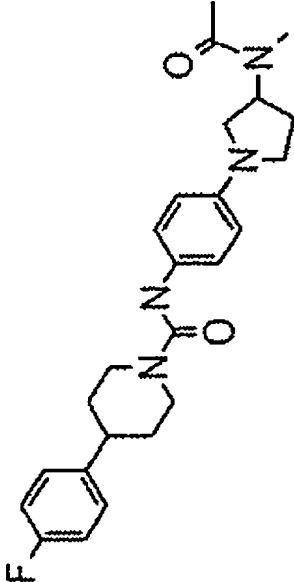
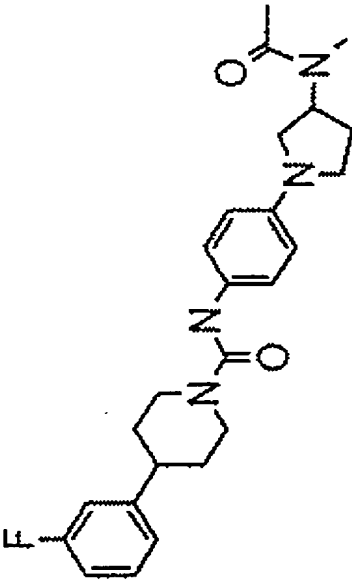
191		N-[1-(4-{3-[4-(2-Fluorophenoxy)phenyl]ureido}phenyl)pyrrolidin-3-yl]-N-methylacetamide	C26H27FN4O3	462.53	463
192		N-{1-(4-{3-[4-(2-ylureido)phenyl]pyrrolidin-3-yl}-N-methylacetamide	C26H28N4O2	428.54	429
193		N-[1-(4-{3-[4-(2-Methoxyphenoxy)phenyl]ureido}phenyl)pyrrolidin-3-yl]-N-methylacetamide	C27H30N4O4	474.56	475
194		N-(1-{4-[3-(4-Isobutoxyphenyl)ureido]phenyl}pyrrolidin-3-yl)-N-methylacetamide	C24H32N4O3	424.55	425
195		N-(1-{4-[3-(4-Cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)-N-methylacetamide	C25H32N4O3	436.56	437

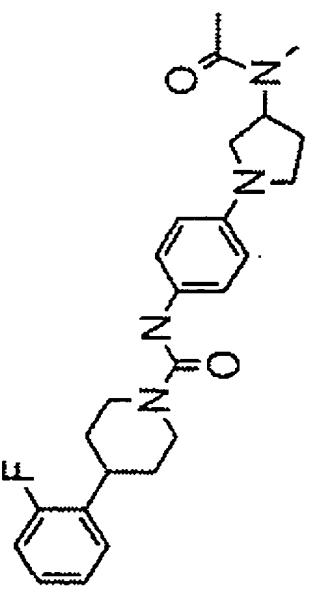
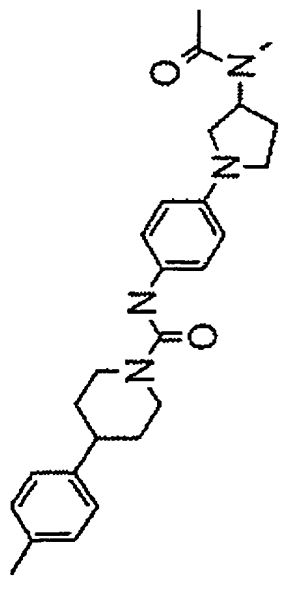
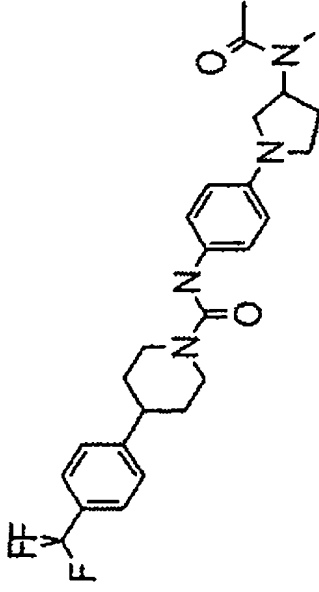
196		N-[1-(4-{3-[4-(4-Fluorophenoxy)phenyl]ureido}phenyl)pyrrolidin-3-yl]-N-methylacetamide	C26H27FN4O3	462.53	463
197		N-[1-(4-{3-[4-(3-Methoxyphenoxy)phenyl]ureido}phenyl)pyrrolidin-3-yl]-N-methylacetamide	C27H30N4O4	474.56	475
198		4-(3-Acetylamino)phenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]-phenyl}amide	C27H35N5O3	477.61	478
199		N-Methyl-N-(1-{4-[3-(5-phenylpyridin-2-yl)ureido]phenyl}pyrrolidin-3-yl)acetamide	C25H27N5O2	429.53	430

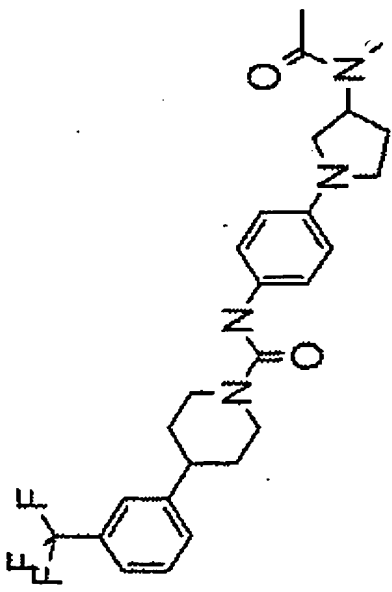
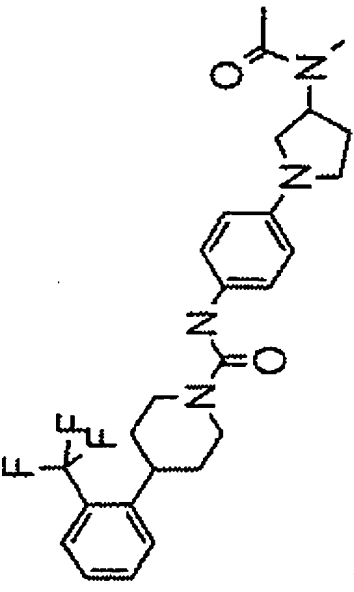
200		N-(1-{4-[3-(2-Acetylamino-4-phenylsulfanylphenyl)-ureido]phenyl}pyrrolidin-3-yl)-N-methylacetamide	C28H31N5O3S	517.65	518
201		N-(1-{4-[3-(4'-Cyanobiphenyl-4-yl)ureido]phenyl}pyrrolidin-3-yl)-N-methylacetamide	C27H27N5O2	453.55	454
202		N-(1-{4-[3-(2-Methoxybiphenyl-4-yl)ureido]phenyl}pyrrolidin-3-yl)-N-methylacetamide	C27H30N4O3	458.57	459

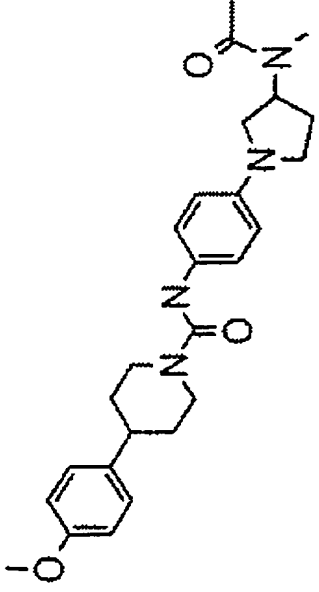
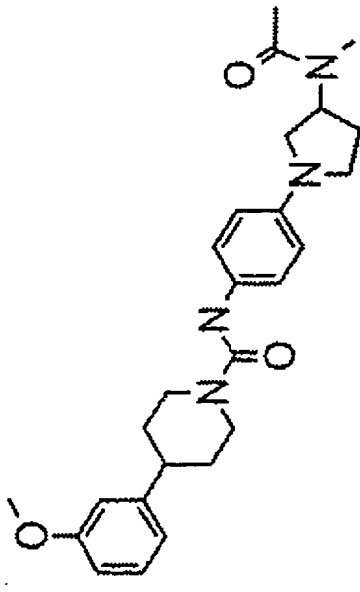
203		4-(2-Chlorophenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C25H31ClN4O2	455.00	455
204		N-(1-{4-[3-(4-Benzenesulfonyl-3-chlorophenyl)-ureido]phenyl}pyrrolidin-3-yl)-N-methylacetamide	C26H27ClN4O4S	527.05	527
205		4-(4-Chlorophenyl)-4-hydroxypiperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C25H31ClN4O3	471.00	471

206		4-Phenylpiperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C25H32N4O2	420.56	421
207		4-Cyano-4-phenylpiperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C26H31N5O2	445.57	446
208		4-Acetyl-4-phenylpiperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C27H34N4O3	462.60	463

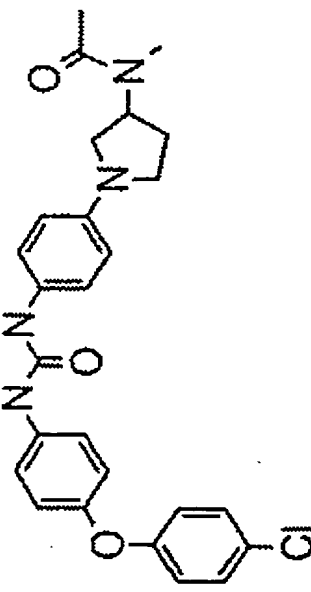
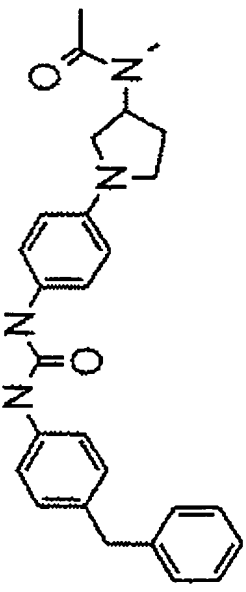
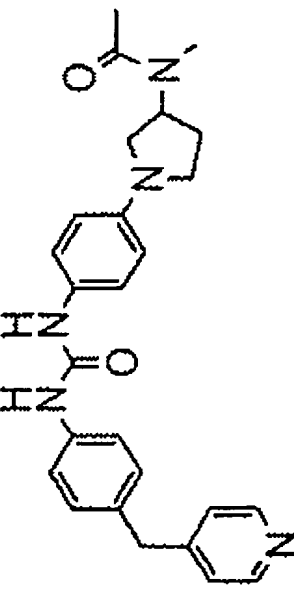
209		4-(2-Methoxyphenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}-amide	C26H34N4O3	450.59	451
210		4-(4-Fluorophenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}-amide	C25H31FN4O2	438.55	439
211		4-(3-Fluorophenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}-amide	C25H31FN4O2	438.55	439

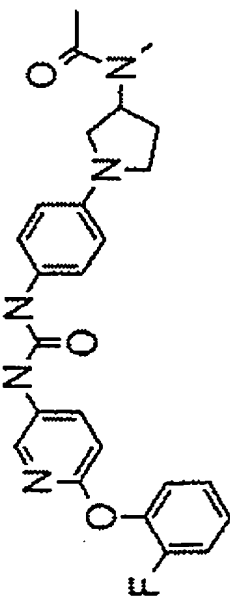
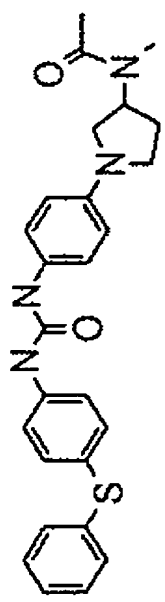
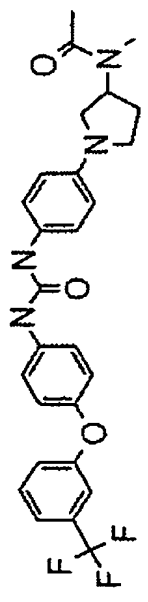
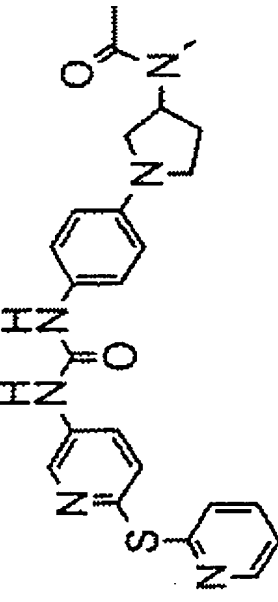
212		4-(2-Fluorophenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C25H31FN4O2	438.55	439
213		4-p-Tolylpiperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C26H34N4O2	434.59	435
214		4-(4-Trifluoromethylphenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C26H31F3N4O2	488.56	489

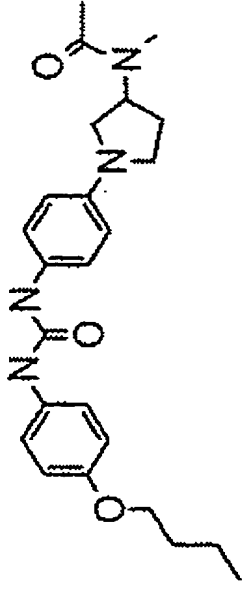
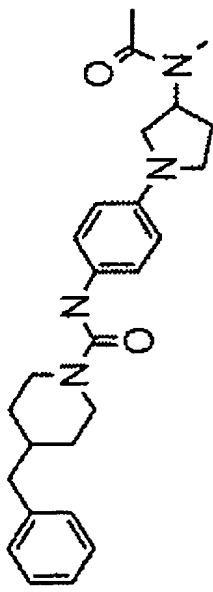
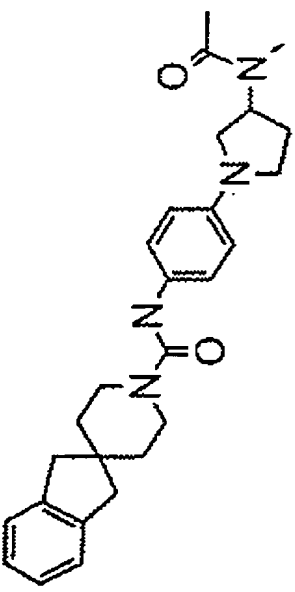
215		4-(3-(Trifluoromethylphenyl)piperidine-1-carboxylic acid {4-[3-(acetyl(methylamino)pyrrolidin-1-yl]phenyl}amide	C26H31F3N4O2	488.56	489
216		4-(2-(Trifluoromethylphenyl)piperidine-1-carboxylic acid {4-[3-(acetyl(methylamino)pyrrolidin-1-yl]phenyl}amide	C26H31F3N4O2	488.56	489

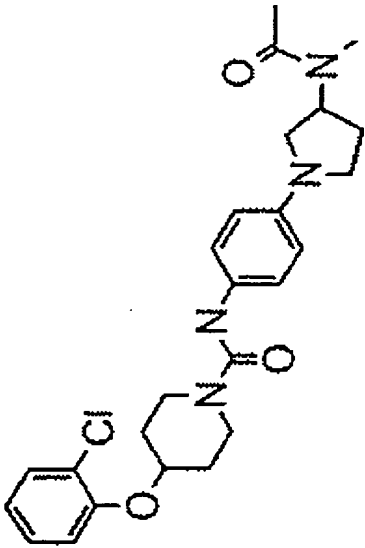
217		4-((4-Methoxyphenyl)piperidin-1-yl)pyrrolidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}-amide	C26H34N4O3	450.59	451
218		4-((3-Methoxyphenyl)piperidin-1-yl)pyrrolidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}-amide	C26H34N4O3	450.59	451

219		4-Naphthalen-2-ylpiperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C29H34N4O2	470.62	471
220		Benzo[c]-1-oxa-8-aza-spiro[4,5]decane-8-car {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C26H32N4O3	448.57	449
221		N-(1-{4-[3-(9-Ethyl-9H-carbazol-3-yl)ureido]-phenyl}pyrrolidin-3-yl)-N-methylacetamide	C28H31N5O2	469.59	470

222		N-(1-(4-(3-[4-(4-Chlorophenoxy)phenyl]ureido)-phenyl)pyrrolidin-3-yl)-N-methylacetamide	C26H27ClN4O3	478.98	479
223		N-(1-(4-[3-(4-Benzylphenyl)ureido]phenyl)-pyrrolidin-3-yl)-N-methylacetamide	C27H30N4O2	442.57	443
224		N-Methyl-N-(1-(4-[3-(4-[3-(4-Pyridin-4-ylmethyl)phenyl]-ureido]phenyl)pyrrolidin-3-yl)acetamide	C28H30F3N5O4	443.55	444

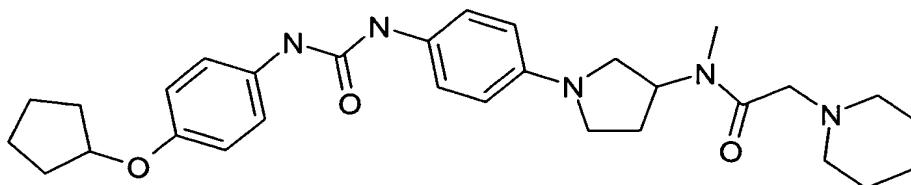
225		N-[1-(4-{3-[6-(2-Fluorophenoxy)pyridin-3-yl]ureido}-phenyl)pyrrolidin-3-yl]-N-methylacetamide	C25H26FN5O3	463.52	464
226		N-Methyl-N-[1-(4-{3-[4-(4-phenylsulfanylphenyl)ureido]phenyl}pyrrolidin-3-yl)]acetamide	C26H28N4O2S	460.60	461
227		N-Methyl-N-[1-(4-{3-[4-(3-(3-trifluoromethylphenoxy)phenyl]ureido)phenyl]pyrrolidin-3-yl)]acetamide	C27H27F3N4O3	512.54	513
228		N-Methyl-N-[1-(4-{3-[6-(pyridin-2-ylsulfanyl)pyridin-3-yl]ureido]phenyl]pyrrolidin-3-yl)]acetamide	C26H27F3N6O4 S	462.58	463

229		N-(1-(4-[3-(4-Butoxyphenyl)ureido]phenyl)-pyrrolidin-3-yl)-N-methylacetamide	C24H32N4O3	424.55	425
230		4-Benzylpiperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C26H34N4O2	434.59	435
231		Benzo-8-azaspiro[4.5]decane-8-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide	C27H34N4O2	446.60	447

234	 <chem>CC(=O)N1CCCN1c2ccc(cc2)CN(C(=O)N3CCN(C3)C4=CC=CC=C4)C5=CC=CC=C5C6=CC=C(C=C6)OC7CCNCC7C8=CC=CC=C8C9=CC=CC=C9Cl</chem>	4-(2-Chlorophenoxy)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}- amide	C ₂₅ H ₃₁ ClN ₄ O ₃	471.00	471
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Example 235

N-(1-{4-[3-(4-Cyclopentyloxyphenyl)ureido]phenyl}pyrrolidin-3-yl)-N-methyl-2-piperidin-1-yl-acetamide



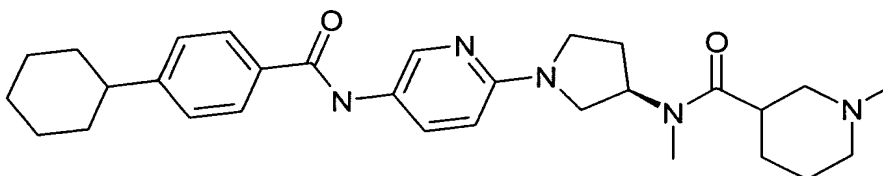
5

1-(4-Cyclopentyloxyphenyl)-3-[4-(3-methylaminopyrrolidin-1-yl)phenyl]urea was reacted with piperidin-1-ylacetic acid by method E. This resulted in the product with the molecular weight of 519.69 (C₃₀H₄₁N₅O₃); MS (ESI): 520 (M+H⁺).

10

Example 236

1-Methylpiperidine-3-carboxylic acid {(R)-1-[5-(4-cyclohexylbenzoylamino)pyridin-2-yl]pyrrolidin-3-yl}methanamide



15

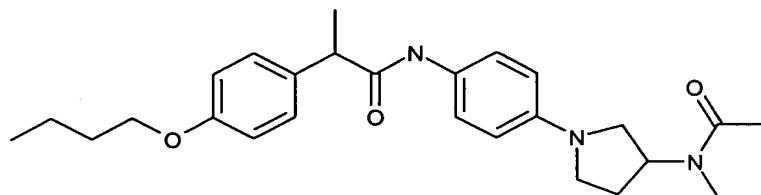
(R)-4-Cyclohexyl-N-[6-(3-methylaminopyrrolidin-1-yl)pyridin-3-yl]benzamide was reacted with 1-methylpiperidin-3-carboxylic acid by method E. This resulted in the product with the molecular weight of 503.69 (C₃₀H₄₁N₅O₂); MS (ESI): 504 (M+H⁺).

20

Example 237

N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-2-(4-butoxyphenyl)propionamide

157



Method H

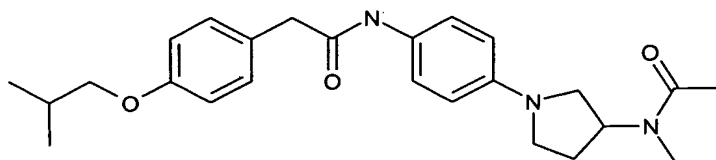
Caesium carbonate (36 mg) and n-butyl bromide (15 mg) were added to a solution of N-{4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}-2-(4-hydroxyphenyl)propionamide (27 mg) in DMF (1 ml). After a reaction time of 2 hours at room temperature, water was added to the mixture, and it was extracted with ethyl acetate. The organic phase was dried over sodium sulfate and concentrated, and the residue was crystallized from diethyl ether/methanol. This resulted in the product with the molecular weight of 437.59 (C₂₆H₃₅N₃O₃); MS(ESI): 438 (M+H⁺).

N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-2-(4-hydroxyphenyl)propionamide

N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamid was reacted with 2-(4-hydroxyphenyl)propionic acid by method I. This resulted in the product with the molecular weight of 381.48 (C₂₂H₂₇N₃O₃); MS(ESI): 382 (M+H⁺).

Example 238

N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-2-(4-isobutoxyphenyl)acetamide



N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-2-(4-hydroxyphenyl)acetamide was reacted with isobutyl bromide by method H.

This resulted in the product with the molecular weight of 423.56 (C₂₅H₃₃N₃O₃); MS(ESI): 424 (M+H⁺).

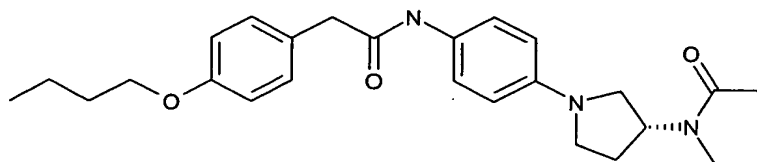
N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-2-(4-hydroxyphenyl)acetamide

Method I

- 4-Hydroxyphenylacetic acid (305 mg), 1-hydroxybenzotriazole (300 mg)
 5 and 1-(3-dimethylaminopropyl)-3-ethylcarbodiimide hydrochloride (480 mg) in DMF (5 ml) were stirred with N-[1-(4-aminophenyl)pyrrolidin-3-yl]-N-methylacetamide (470 mg) at room temperature for 3 hours. Water was then added to the mixture, which was extracted with ethyl acetate. The organic phase was washed with saturated sodium chloride solution, dried
 10 over sodium sulfate, concentrated and crystallized from diethyl ether. This resulted in the product with the molecular weight of 367.45 (C₂₁H₂₅N₃O₃); MS(ESI): 368 (M+H⁺).

15 Example 239

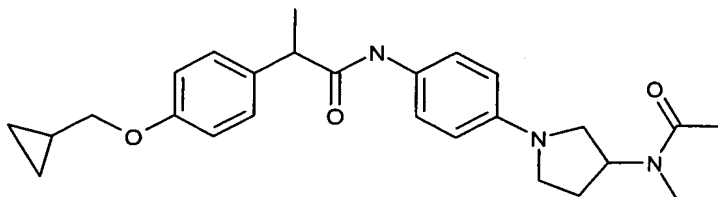
(*R*)-N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-2-(4-butoxyphenyl)acetamide



- (*R*)-N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted
 20 with 4-butoxyphenylacetic acid by method E. This resulted in the product with the molecular weight of 423.56 (C₂₅H₃₃N₃O₃); MS(ESI): 424 (M+H⁺).

Example 240

- 25 N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-2-(4-cyclopropylmethoxyphenyl)propionamide

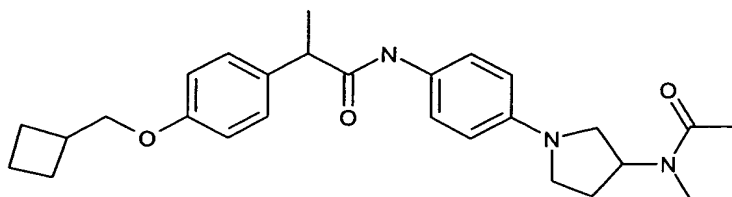


N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-2-(4-hydroxyphenyl)propionamide was reacted with bromomethylcyclopropane by method H. This resulted in the product with the molecular weight of 435.57 (C₂₆H₃₃N₃O₃); MS(ESI): 436 (M+H⁺).

5

Example 241

N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-2-(4-cyclobutylmethoxyphenyl)propionamide



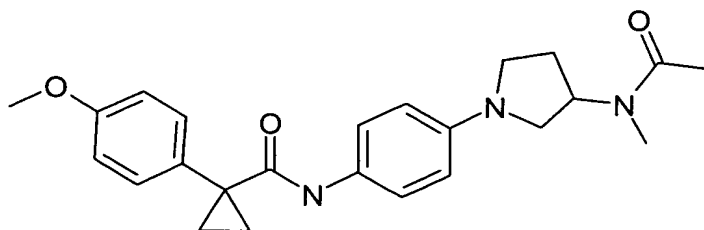
10

N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-2-(4-hydroxyphenyl)propionamide was reacted with bromomethylcyclobutane by method H. This resulted in a product with the molecular weight 449.60 (C₂₇H₃₅N₃O₃); MS(ESI): 450 (M+H⁺).

15

Example 242

1-(4-Methoxyphenyl)cyclopropanecarboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide



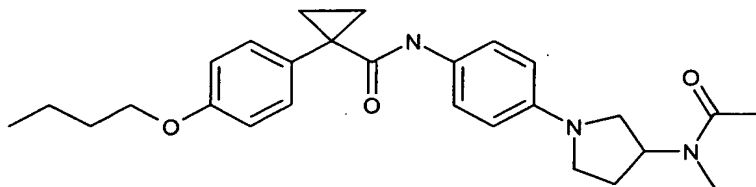
20

N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted with 1-(4-methoxyphenyl)-1-cyclopropanecarboxylic acid by method E. This resulted in the product with the molecular weight of 407.52 (C₂₄H₂₉N₃O₃); MS(ESI): 408 (M+H⁺).

25

Example 243

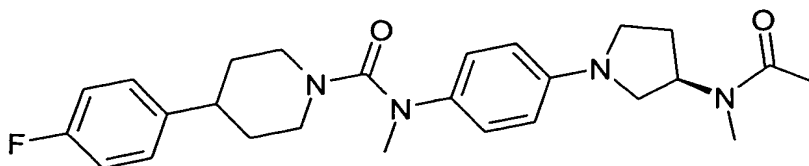
1-(4-Butoxyphenyl)cyclopropanecarboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide



- 5 1-(4-Hydroxyphenyl)cyclopropanecarboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide was reacted with n-butyl bromide by method H. This resulted in the product with the molecular weight of 449.60 (C₂₇H₃₅N₃O₃); MS(ESI): 450 (M+H⁺).
- 10 1-(4-Hydroxyphenyl)cyclopropanecarboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide
- Boron tribromide-dimethyl sulfide (460 mg) was added to a solution of 1-(4-methoxyphenyl)cyclopropanecarboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide (540 mg) in
- 15 dichloromethane (5.5 ml) at 0°C. After a reaction time of 12 hours at room temperature, water was added to the mixture, the phases were separated, and the aqueous phase was extracted with dichloromethane. The combined organic phases were dried over sodium sulfate, concentrated and purified by chromatography (silica gel, toluene/ethanol/ethyl acetate
- 20 8:1:1 with addition of 0.1% triethylamine). This resulted in the product with the molecular weight of 393.49 (C₂₃H₂₇N₃O₃); MS(ESI): 394 (M+H⁺).

Example 244

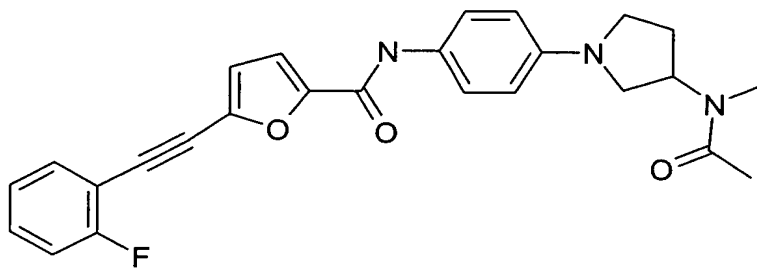
- 25 (R)-4-(4-Fluorophenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}-N-methylamide



(*R*)-4-(4-Fluorophenyl)piperidine-1-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide (22 mg) was added to a suspension of sodium hydride (95% in oil; 0.005 g) in DMF (1 ml). After evolution of gas ceased, iodomethane (0.02 ml) was added. After two hours, the reaction mixture was cautiously hydrolyzed with water and extracted with dichloromethane. The organic phase was dried over magnesium sulfate and concentrated, and the residue was crystallized from pentane. This resulted in the product with the molecular weight of 452.58 (C₂₆H₃₃FN₄O₂); MS (ESI): 453 (M+H⁺).

Example 245

5-2-[(2-Fluorophenyl)ethynyl]furan-2-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide



Method J

Firstly diisopropylamine (14.9 mg) and then a solution of 5-bromofuran-2-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide (50.0 mg) and 1-ethynyl-2-fluorobenzene (17.7 mg) in dioxane (0.5 ml) and DMF (0.2 ml) were added under inert conditions to a suspension of palladium bis(tri-*tert*-butylphosphine) dichloride (3.8 mg) and copper(I) iodide (0.9 mg) in DMF (0.5 ml). After a reaction time of 12 hours at room temperature, the mixture was diluted with ethyl acetate and filtered through silica gel, and the filtrate was concentrated and purified by preparative HPLC. This resulted in the product with the molecular weight of 445.18 (C₂₆H₂₄FN₃O₃); MS(ESI): 446 (M+H⁺) as hydrotrifluoroacetate.

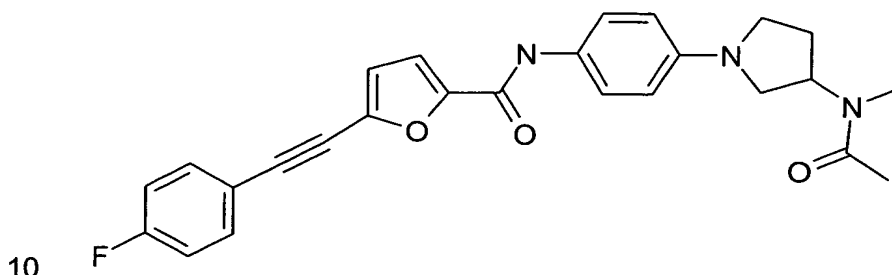
5-Bromofuran-2-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide

N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-N-methylacetamide was reacted with 5-bromo-2-furancarboxylic acid by method E. This resulted in the product with the molecular weight of 406.28 (C₁₈H₂₀BrN₃O₃); MS(ESI): 407 (M+H⁺).

5

Example 246

5-2-[(4-Fluorophenyl)ethynyl]furan-2-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide



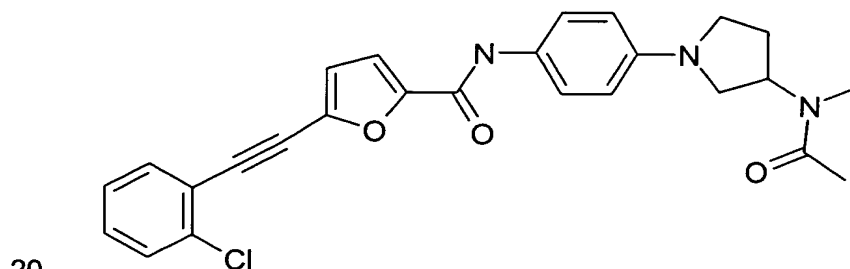
10

5-Bromofuran-2-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide was reacted with 1-ethynyl-4-fluorobenzene by method J. This resulted in the product with the molecular weight of 445.18 (C₂₆H₂₄FN₃O₃); MS(ESI): 446 (M+H⁺) as hydrotrifluoroacetate.

15

Example 247

5-2-[(2-Chlorophenyl)ethynyl]furan-2-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide

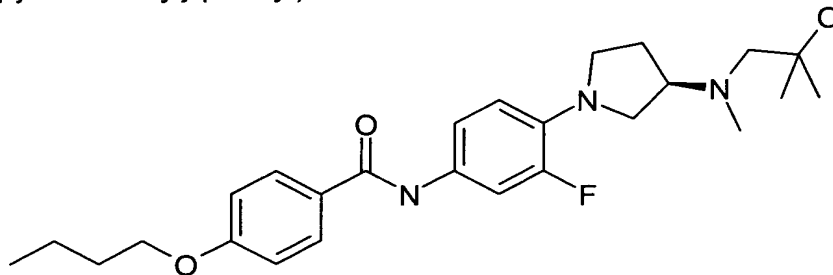


20

5-Bromofuran-2-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide was reacted with 1-ethynyl-2-chlorobenzene by method J. This resulted in the product with the molecular weight of 461.15 (C₂₆H₂₄ClN₃O₃); MS(ESI): 462 (M+H⁺) as hydrotrifluoroacetate.

Example 248

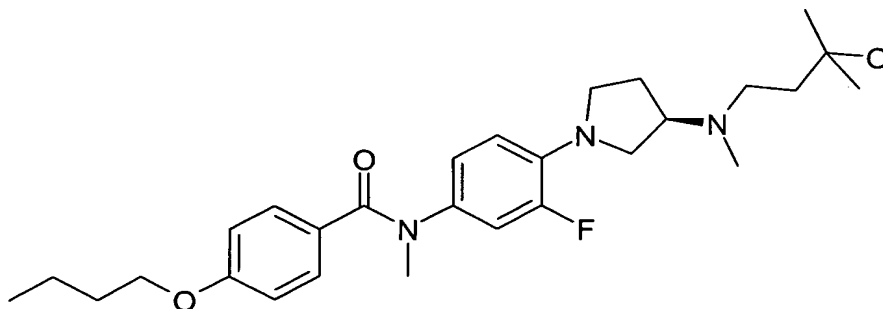
5 R-4-Butoxy-N-(3-fluoro-4-{3-[(2-hydroxy-2-methylpropyl)methylamino]-pyrrolidin-1-yl}-phenyl)benzamide



A solution of (R)-4-butoxy-N-[3-fluoro-4-(3-methylaminopyrrolidin-1-yl)phenyl]benzamide (0.03 g) and isobutylene oxide in ethanol (5 ml) were heated under reflux for 3 hours. It was then concentrated in vacuo. This
 10 resulted in the product with the molecular weight of 457.59 (C₂₆H₃₆FN₃O₃); MS (ESI): 458 (M+H⁺).

Example 249

15 R-4-Butoxy-N-(3-fluoro-4-{3-[(3-hydroxy-3-methylbutyl)methylamino]pyrrolidin-1-yl}-phenyl)-N-methylbenzamide



A solution of (R)-4-butoxy-N-[3-fluoro-4-(3-methylaminopyrrolidin-1-yl)phenyl]benzamide (0.03 g), triethylamine (0.02 g) and 4-bromo-2-methylbutan-2-ol (0.03 g) in DMF (2 ml) was heated at 80°C for 16 hours.
 20 After cooling, ethyl acetate (100 ml) was added, the mixture was washed with water (2 x 50 ml), and the organic phase was dried with sodium sulfate, filtered and concentrated. The residue was purified by preparative HPLC. This resulted in the product with the molecular weight of 471.62 (C₂₇H₃₈FN₃O₃); MS (ESI): 472 (M+H⁺).

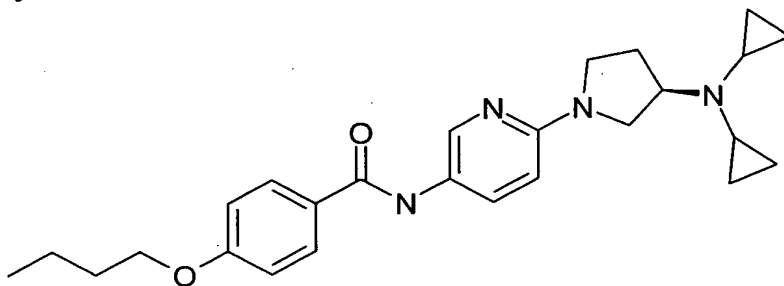
4-Bromo-2-methylbutan-2-ol

Methylmagnesium bromide (3M in diethyl ether, 46 ml) was added to a solution of ethyl 3-bromopropionate (10 g) in diethyl ether (100 ml) at room temperature under argon. During this, the mixture was kept at above 20°C and below 35°C. After 2 hours, the mixture was poured into a saturated ammonium chloride solution. This was followed by extraction with diethyl ether, drying with sodium sulfate, filtration and concentration. This resulted in the desired product.

10

Example 250

R-4-Butoxy-N-[6-(3-dicyclopropylaminopyrrolidin-1-yl)pyridin-3-yl]benzamide



15 Method K

A solution of (R)-N-[6-(3-aminopyrrolidin-1-yl)pyridin-3-yl]-4-butoxybenzamide (0.065 g) in methanol (2 ml) was mixed with glacial acetic acid (0.11 ml) and [(1-ethoxycyclopropyl)oxy]trimethylsilane (0.19 g). Then sodium cyanoborohydride (0.051 g) was added and the mixture was heated under reflux for 16 hours. The mixture was then filtered, concentrated, taken up in dichloromethane, washed with sodium hydroxide (2N; 20 ml) and sodium chloride solution (20 ml), dried with magnesium sulfate and concentrated. The residue was purified by preparative HPLC. This resulted in the product with the molecular weight of 434.59 (C₂₆H₃₄N₄O₂); MS (ESI): 435 (M+H⁺).

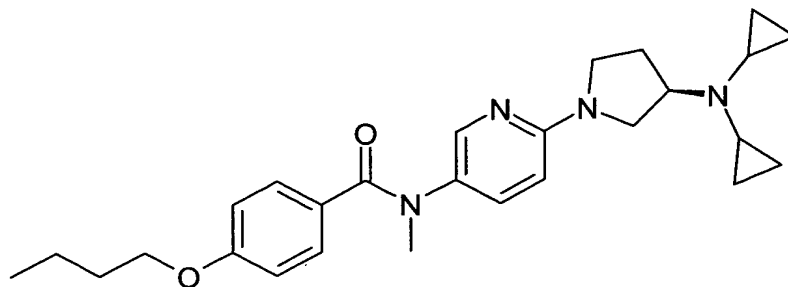
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Example 251

R-4-Butoxy-N-[6-(3-dicyclopropylaminopyrrolidin-1-yl)pyridin-3-yl]-N-methylbenzamide

30

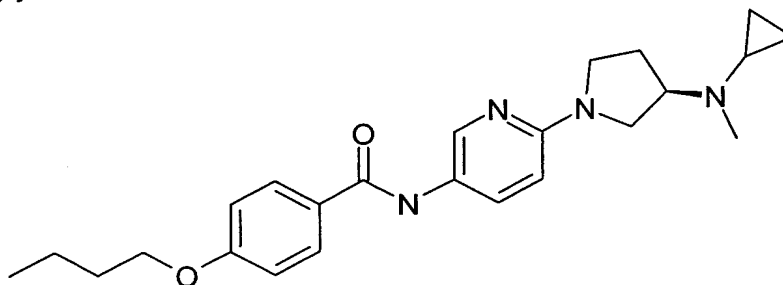
165



(R)-4-Butoxy-N-[6-(3-dicyclopropylaminopyrrolidin-1-yl)pyridin-3-yl]benzamide was methylated by method F. This resulted in the product with the molecular weight of 448.61 (C₂₇H₃₆N₄O₂); MS (ESI): 449 (M+H⁺).

Example 252

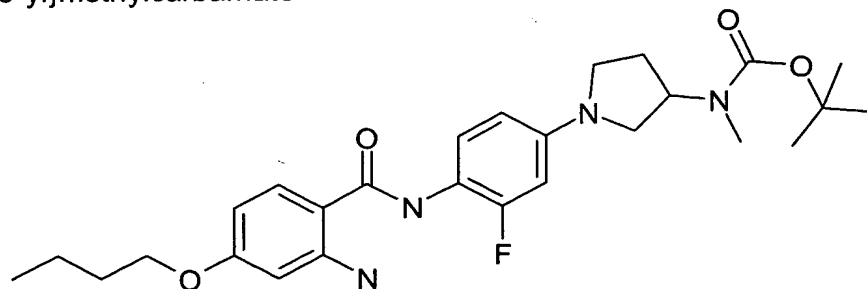
R-4-Butoxy-N-[6-[3-(cyclopropylmethylamino)pyrrolidin-1-yl]pyridin-3-yl]benzamide



(R)-4-Butoxy-N-[6-(3-methylaminopyrrolidin-1-yl)pyridin-3-yl]benzamide was cyclopropylated by method K. This resulted in the product with the molecular weight of 408.551 (C₂₄H₃₂N₄O₂); MS (ESI): 409 (M+H⁺).

Example 253

tert-Butyl {1-[4-(2-amino-4-butoxybenzoylamino)-3-fluorophenyl]pyrrolidin-3-yl}methylcarbamate



tert-Butyl [1-(4-amino-3-fluorophenyl)pyrrolidin-3-yl]methylcarbamate was

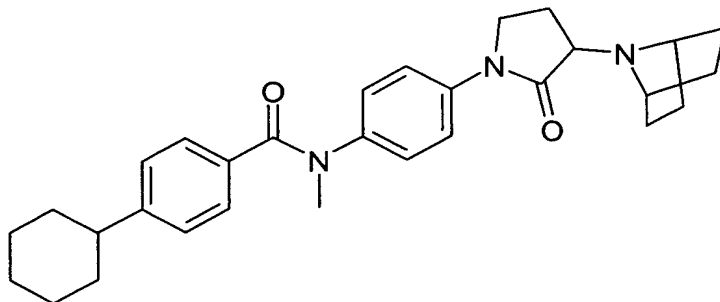
reacted with 4-butoxy-2-nitrobenzoic acid by method E, followed by hydrogenation. This resulted in the product with the molecular weight of 500.62 (C₂₇H₃₇FN₄O₄); MS (ESI): 501 (M+H⁺).

5 4-Butoxy-2-nitrobenzoic acid

A solution of 4-fluoro-2-nitrobenzoic acid (1.81 g) in butanol (20 ml) was mixed with sulfuric acid (3 ml) and stirred at 110°C for 4 hours. Ethyl acetate (100 ml) was added, and the mixture was washed with saturated sodium bicarbonate solution (3 × 50 ml), dried with sodium sulfate, filtered and concentrated in vacuo. The residue (2.2 g) was added dropwise at –10°C to a sodium butoxylate solution prepared from butanol (20 ml) and sodium hydride (2.18 g) at –10°C under argon and then stirred for 20 hours. Ethyl acetate (100 ml) was added, and the mixture was washed with water (2 × 50 ml), dried over sodium sulfate, filtered and concentrated in vacuo. The residue was purified by preparative HPLC. The butyl 4-butoxy-2-nitrobenzoate was hydrolyzed with sodium hydroxide (5N; 100 ml) in ethanol at room temperature for 3 hours. The mixture was acidified with hydrochloric acid (10N; 100 ml) and extracted with dichloromethane, and the organic phase was dried over sodium sulfate, filtered and concentrated. This resulted in the product with the molecular weight of 239.23 (C₁₁H₁₃NO₅); MS (ESI): 240 (M+H⁺).

Example 254

25 N-{4-[3-(7-Azabicyclo[2.2.1]hept-7-yl)-2-oxopyrrolidin-1-yl]phenyl}-4-cyclohexyl-N-methylbenzamide



Method L

A mixture of N-[4-(3-bromo-2-oxopyrrolidin-1-yl)phenyl]-4-cyclohexyl-N-methylbenzamide (100 mg), potassium carbonate (60 mg), 7-azabicyclo[2.2.1]heptane (44 mg) and DMF (2 ml) was kept at 50°C for 6 hours. The mixture was diluted with water and extracted with ethyl acetate.

The organic phase was dried over magnesium sulfate and concentrated. The residue was purified by preparative HPLC. This resulted in the product with the molecular weight of 471.65 (C₃₀H₃₇N₃O₂); MS (ESI): 472 (M+H⁺).

5

N-[4-(3-Bromo-2-oxo-pyrrolidin-1-yl)phenyl]-4-cyclohexyl-N-methylbenzamide

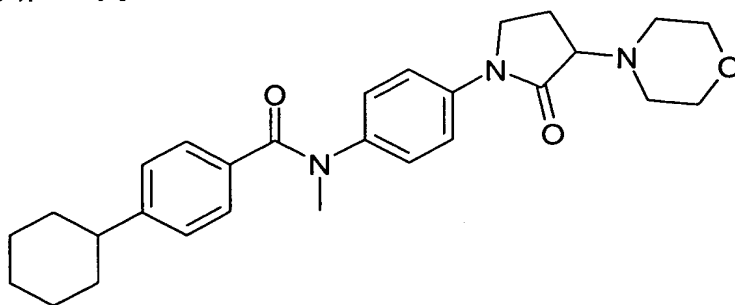
N-(4-Aminophenyl)-4-cyclohexyl-N-methylbenzamide (3.0 g) in acetonitrile (30 ml) was mixed with trisodium phosphate (0.95 g) and, at 0°C, 2-bromo-4-chlorobutyryl bromide (2.9 g) was added. After one hour, a solution of sodium hydroxide (0.85 g) in water (10 ml) was added and the mixture was stirred vigorously at room temperature for 6 hours. The same amount of sodium hydroxide solution was then added, and stirring was continued for 48 hours. The reaction solution was diluted with water and extracted with ethyl acetate. The organic phase was dried over magnesium sulfate and concentrated. The residue was purified by chromatography on silica gel (mobile phase ethyl acetate/heptane 1:2). This resulted in the product with the molecular weight of 455.40 (C₂₄H₂₇BrN₂O₂); MS (ESI): 456 (M+H⁺).

20 N-(4-Aminophenyl)-4-cyclohexyl-N-methylbenzamide

4-Cyclohexylcarboxylic acid (5.0 g) and 4-nitrophenylisocyanate (4.0 g) were stirred in toluene (150 ml) for 3 hours and then left to stand overnight. The precipitate was filtered off with suction and washed with diethyl ether. The resulting amide was ethylated by method F and hydrogenated by method B. This resulted in the product with the molecular weight of 308.43 (C₂₀H₂₄N₂O); MS (ESI): 309 (M+H⁺).

Example 255

30 4-Cyclohexyl-N-methyl-N-[4-(3-morpholin-4-yl-2-oxopyrrolidin-1-yl)phenyl]benzamide

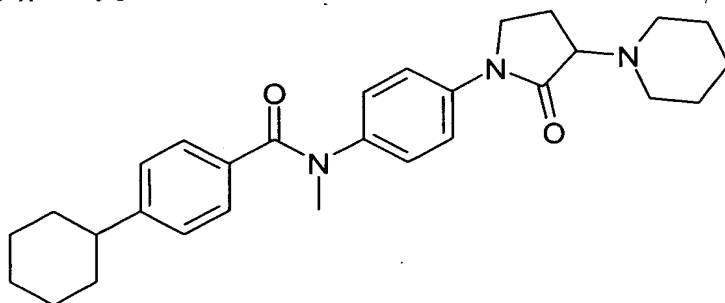


N-[4-(3-Bromo-2-oxo-pyrrolidin-1-yl)phenyl]-4-cyclohexyl-N-methylbenzamide was reacted with morpholine by method L. This resulted in the product with the molecular weight 461.61 (C₂₈H₃₅N₃O₃); MS (ESI): 462 (M+H⁺).

5

Example 256

4-Cyclohexyl-N-methyl-N-[4-(2-oxo-3-piperidin-1-ylpyrrolidin-1-yl)phenyl]benzamide



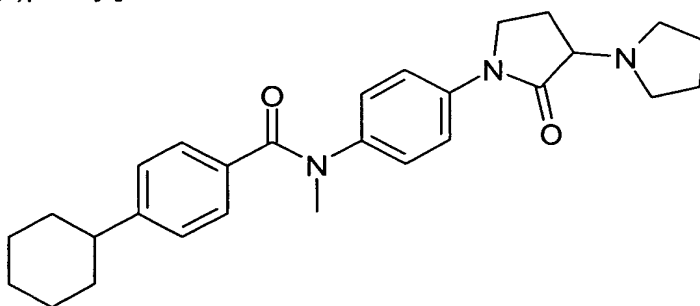
10

N-[4-(3-Bromo-2-oxopyrrolidin-1-yl)phenyl]-4-cyclohexyl-N-methylbenzamide was reacted with piperidine by method L. This resulted in the product with the molecular weight of 459.64 (C₂₉H₃₇N₃O₂); MS (ESI): 460 (M+H⁺).

15

Example 257

4-Cyclohexyl-N-methyl-N-[4-(2'-oxo[1,3']bipyrrolidinyl-1'-yl)phenyl]benzamide

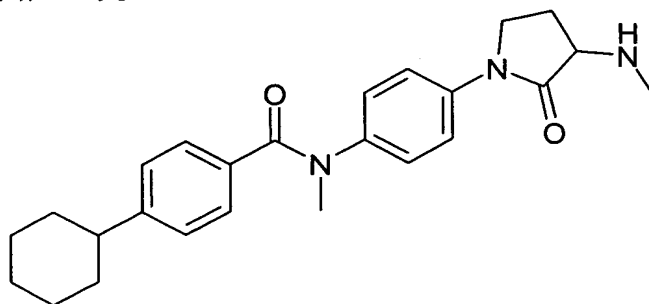


20

N-[4-(3-Bromo-2-oxopyrrolidin-1-yl)phenyl]-4-cyclohexyl-N-methylbenzamide was reacted with pyrrolidine by method L. This resulted in the product with the molecular weight of 445.61 (C₂₈H₃₅N₃O₂); MS (ESI): 446 (M+H⁺).

Example 258

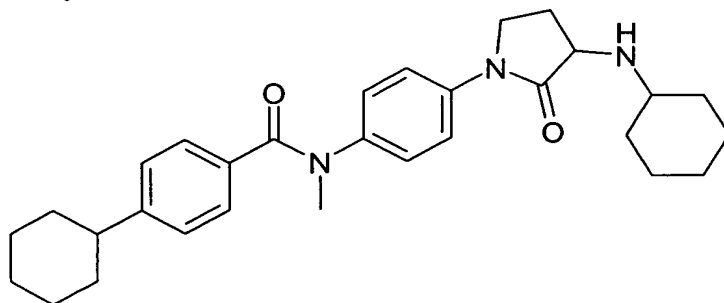
4-Cyclohexyl-N-methyl-N-[4-(3-methylamino-2-oxopyrrolidin-1-yl)phenyl]benzamide



N-[4-(3-Bromo-2-oxopyrrolidin-1-yl)phenyl]-4-cyclohexyl-N-methylbenzamide was reacted with methylamine by method L. This resulted in the product with the molecular weight of 405.54 (C₂₅H₃₁N₃O₂); MS (ESI): 406 (M+H⁺).

Example 259

4-Cyclohexyl-N-[4-(3-cyclohexylamino-2-oxopyrrolidin-1-yl)phenyl]-N-methylbenzamide



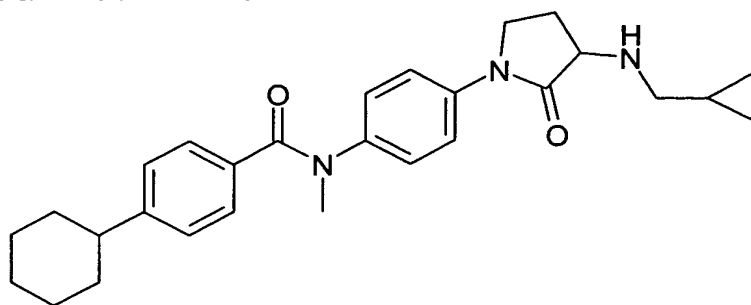
N-[4-(3-Bromo-2-oxo-pyrrolidin-1-yl)phenyl]-4-cyclohexyl-N-methylbenzamide was reacted with cyclohexylamine by method L. This resulted in the product with the molecular weight of 473.66 (C₃₀H₃₉N₃O₂); MS (ESI): 474 (M+H⁺).

Example 260

4-Cyclohexyl-N-[4-[3-(cyclopropylmethylamino)-2-oxopyrrolidin-1-

170

yl]phenyl]-N-methylbenzamide

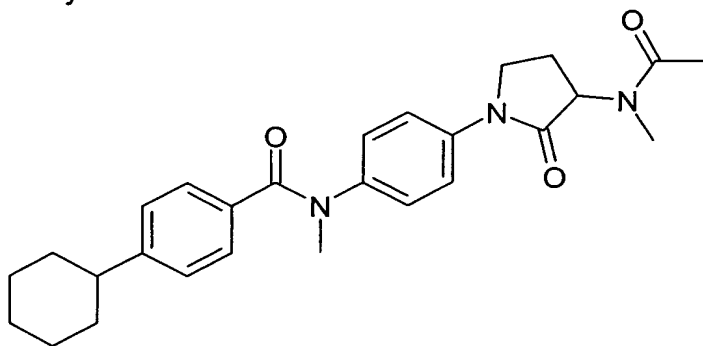


N-[4-(3-Bromo-2-oxopyrrolidin-1-yl)phenyl]-4-cyclohexyl-N-methylbenzamide was reacted with cyclopropylmethylamine by method L.

- 5 This resulted in the product with the molecular weight of 445.61 (C₂₈H₃₅N₃O₂); MS (ESI): 446 (M+H⁺).

Example 261

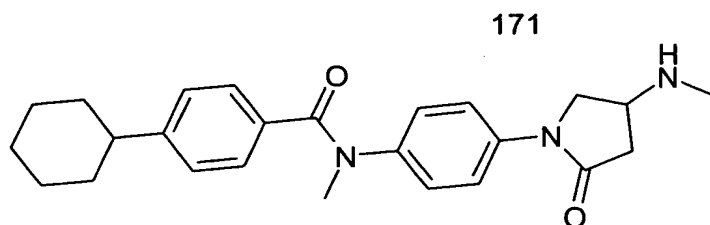
- 10 N-{4-[3-(Acetylmethylamino)-2-oxopyrrolidin-1-yl]phenyl}-4-cyclohexyl-N-methylbenzamide



- 15 4-Cyclohexyl-N-methyl-N-[4-(3-methylamino-2-oxopyrrolidin-1-yl)phenyl]benzamide (52 mg) was mixed with pyridine (0.5 ml) and acetic anhydride (130 mg) and, after 3 hours, volatile fractions were removed in vacuo. This resulted in the product with the molecular weight of 447.58 (C₂₇H₃₃N₃O₃); MS (ESI): 448 (M+H⁺).

Example 262

- 20 4-Cyclohexyl-N-methyl-N-[4-(4-methylamino-2-oxopyrrolidin-1-yl)phenyl]benzamide



tert-Butanol (8 ml), triethylamine (350 mg) and finally diphenylphosphoryl
 azide (1.18 g) were added to 1-{4-[(4-
 cyclohexylbenzoyl)methylamino]phenyl}-5-oxo-pyrrolidin-3-carboxylic acid
 5 (1.5 g), and the mixture was heated at 95°C for 48 hours. The reaction
 solution was diluted with ethyl acetate and washed twice with water. The
 organic phase was dried over magnesium sulfate and concentrated. The
 crude product was reacted further by method G. This resulted in the
 product with the molecular weight of 405.54 (C₂₅H₃₁N₃O₂); MS (ESI): 406
 10 (M+H⁺).

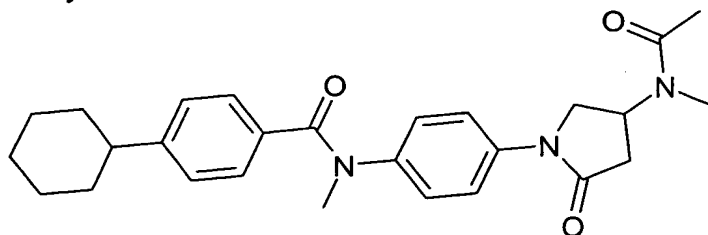
1-{4-[(4-Cyclohexylbenzoyl)methylamino]phenyl}-5-oxo-pyrrolidine-3-
 carboxylic acid

N-(4-Aminophenyl)-4-cyclohexyl-N-methylbenzamide (3.0 g) was heated
 15 with itaconic acid (1.27 g) at 100°C for 3 hours. Purification took place by
 filtration through silica gel (mobile phase ethyl acetate/methanol 5:1). This
 resulted in the product with the molecular weight of 420.51 (C₂₅H₂₈N₂O₄);
 MS (ESI): 421 (M+H⁺).

20

Example 263

N-{4-[4-(Acetylmethylamino)-2-oxopyrrolidin-1-yl]phenyl}-4-cyclohexyl-N-
 methylbenzamide



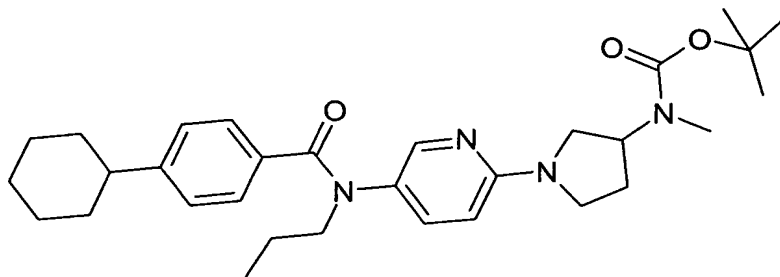
25 4-Cyclohexyl-N-methyl-N-[4-(4-methylamino-2-oxo-pyrrolidin-1-
 yl)phenyl]benzamide (101 mg) was mixed with pyridine (20 mg) and acetic

anhydride (25 mg) and, after 3 hours, volatile fractions were removed in vacuo. This resulted in the product with the molecular weight of 447.58 (C₂₇H₃₃N₃O₃); MS (ESI): 448 (M+H⁺).

5

Example 264

tert-Butyl (1-{5-[(4-cyclohexylbenzoyl)propylamino]pyridin-2-yl}pyrrolidin-3-yl)methyl-carbamate



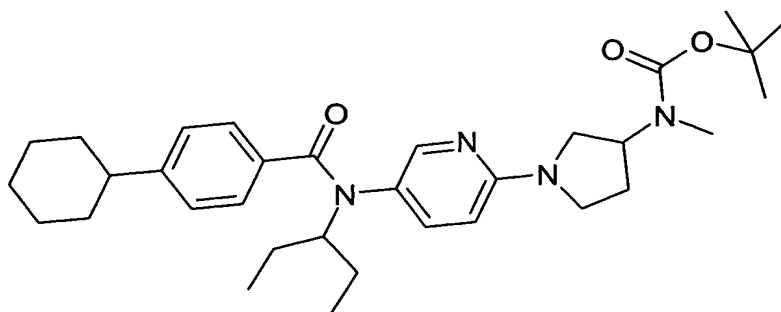
10 Method F-a

tert-Butyl {1-[5-(4-cyclohexylbenzoylamino)pyridin-2-yl]pyrrolidin-3-yl)methylcarbamate (50 mg), cesium carbonate (249 mg), potassium iodide (17 mg), N-methylpyrrolidone (1.5 ml) and propyl iodide (40 mg) were stirred at 60°C for 5 hours. If conversion was incomplete, the mixture was heated to 100°C and, after addition of further propyl iodide (40 mg), heated at 140°C for 12 hours. The reaction mixture was diluted with ethyl acetate, washed with water and sodium bicarbonate solution, dried over Chromabond XTR and concentrated. The residue was purified by preparative HPLC. This resulted in the product with the molecular weight of 520.72 (C₃₁H₄₄N₄O₃); MS (ESI): 521 (M+H⁺).

Example 265

tert-Butyl (1-{5-[(4-cyclohexylbenzoyl)-(1-ethylpropyl)amino]pyridin-2-yl}pyrrolidin-3-yl)-methylcarbamate

173



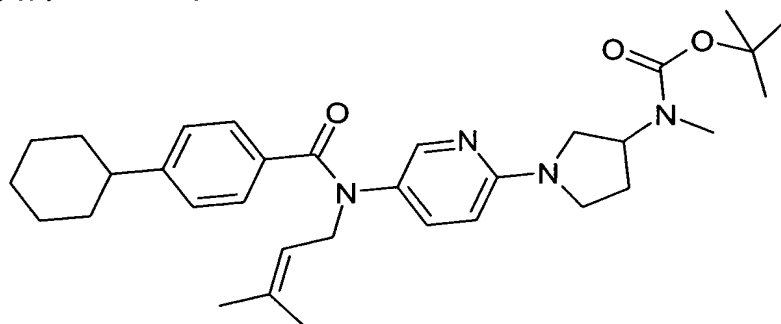
tert-Butyl {1-[5-(4-cyclohexylbenzoylamino)pyridin-2-yl]pyrrolidin-3-yl}methylcarbamate was reacted with 2-ethylbutyl bromide by method F-a. This resulted in the product with the molecular weight of 548.78

5 (C₃₃H₄₈N₄O₃); MS (ESI): 549 (M+H⁺).

Example 266

tert-Butyl (1-{5-[(4-cyclohexylbenzoyl)-(3-methylbut-2-enyl)amino]pyridin-2-yl}pyrrolidin-3-yl)methylcarbamate

10



tert-Butyl {1-[5-(4-cyclohexylbenzoylamino)pyridin-2-yl]pyrrolidin-3-yl}methylcarbamate was reacted with 3-methyl-2-butenyl bromide by method F-a. This resulted in the product with the molecular weight of

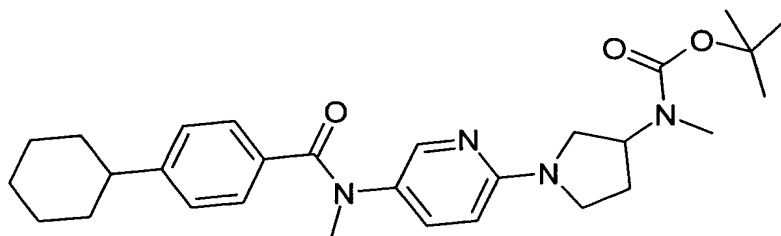
15 546.76 (C₃₃H₄₆N₄O₃); MS (ESI): 547 (M+H⁺).

Example 267

tert-Butyl (1-{5-[(4-cyclohexylbenzoyl)methylamino]pyridin-2-yl}pyrrolidin-3-yl)methylcarbamate

20

174



tert-Butyl {1-[5-(4-cyclohexylbenzoylamino)pyridin-2-yl]pyrrolidin-3-yl}methylcarbamate was reacted with methyl iodide by method F-a. This resulted in the product with the molecular weight of 492.67 (C₂₉H₄₀N₄O₃);
 5 MS (ESI): 493 (M+H⁺).

The following further compounds were obtained by method F-a from tert-butyl {1-[5-(4-cyclohexylbenzoylamino)pyridin-2-yl]pyrrolidin-3-yl}methylcarbamate and the appropriate alkylating agent:

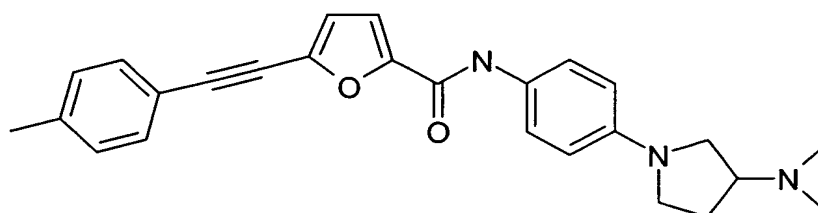
tert-Butyl (1-{5-[sec-butyl-(4-cyclohexylbenzoyl)amino]pyridin-2-yl}pyrrolidin-3-yl)methylcarbamate
 10

tert-Butyl (1-{5-[(4-cyclohexylbenzoyl)isopropylamino]pyridin-2-yl}pyrrolidin-3-yl)methylcarbamate

tert-Butyl (1-{5-[(4-cyclohexylbenzoyl)prop-2-ynylamino]pyridin-2-yl}pyrrolidin-3-yl)-methylcarbamate
 15

Example 268

5-p-Tolyethynylfuran-2-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide
 20



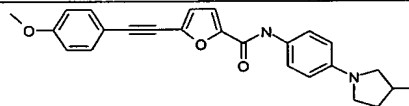
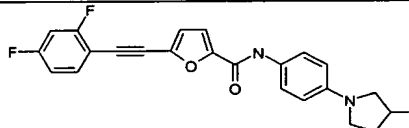
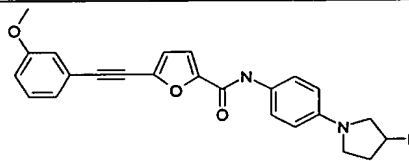
0.042 ml of diisopropylamine was added under argon to 3.8 mg of Pd(tBu)₂Cl₂ and 0.95 mg of Cul in 0.2 ml of DMF. A solution of 94.6 mg of

5-bromofuran-2-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]-amide in 0.3 ml of DMF and a solution of 4-ethynyltoluene in 0.3 ml of DMF were then added dropwise. The solution was stirred at room temperature overnight. The precipitate which had separated out was filtered off with suction and the filtrate purified by preparative HPLC. The desired product with the molecular weight of 413.52; MS (ESI): 414 was obtained as hydrotrifluoroacetate.

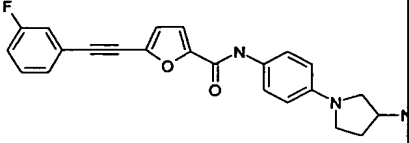
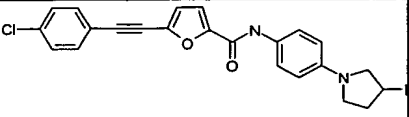
5-Bromofuran-2-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide
[1-(4-Aminophenyl)pyrrolidin-3-yl]dimethylamine was reacted with 5-bromo-2-furancarboxylic acid by method E. The product with a molecular weight of 378.27 (C₁₇H₂₀BrN₃O₂); MS (ESI): 379 (M+H⁺) was obtained as hydrotrifluoroacetate.

15

Examples 269-273 were prepared analogously:

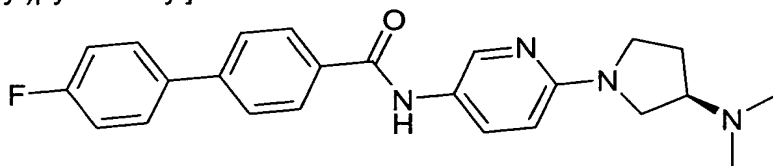
Ex.No.	Structure	Molecular formula	Molecular weight	M+H ⁺
269		C ₂₆ H ₂₇ N ₃ O ₃	429.21	430
270		C ₂₅ H ₂₃ F ₂ N ₃ O ₂	435.18	436
271		C ₂₆ H ₂₇ N ₃ O ₃	429.21	430

176

272		C ₂₅ H ₂₄ FN ₃ O ₂	417.19	418
273		C ₂₅ H ₂₄ ClN ₃ O ₂	433.16	434

Example 274

- 5 (R)-4'-Fluorobiphenyl-4-carboxylic acid [6-(3-dimethylaminopyrrolidin-1-yl)pyridin-3-yl]-amide



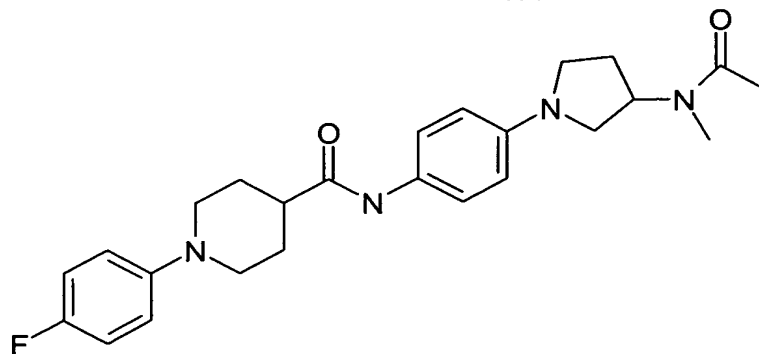
Method M

- 10 (R)-4'-Fluorobiphenyl-4-carboxylic acid [6-(3-methylaminopyrrolidin-1-yl)pyridin-3-yl]-amide (390 mg) dissolved in formic acid (230 mg) was mixed with formaldehyde solution (37% aq.; 0.4 ml) and the mixture was heated at 80°C for 3 hours. The cooled reaction solution was concentrated and partitioned between ethyl acetate and a saturated sodium carbonate solution. The organic phase was dried over magnesium sulfate and concentrated. The crude product was purified by preparative HPLC. This
- 15 resulted in the product with the molecular weight of 404.49 (C₂₄H₂₅FN₄O); MS (ESI): 405 (M+H⁺).

Example 275

- 20 1-(4-Fluorophenyl)piperidine-4-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide

177



Method E-a

A mixture of 0.048 g of 1-(4-fluorophenyl)piperidine-4-carboxylic acid and 0.5 ml of SOCl₂ and one drop of DMF were stirred at room temperature for 2 hours. The excess SOCl₂ was then removed in vacuo. The residue was dissolved in 0.4 ml of DMF, and 0.033 ml of triethylamine and 0.048 g of N-[1-(4-aminophenyl)pyrrolidin-3-yl]-N-methylacetamide were added. The solution was stirred at room temperature overnight. The solution was then filtered and purified by preparative HPLC. This resulted in the product with the molecular weight of 438.20 (C₂₅H₃₁FN₄O₂); MS (ESI): 439 (M+H⁺) as hydrotrifluoroacetate.

1-(4-Fluorophenyl)piperidine-4-carboxylic acid

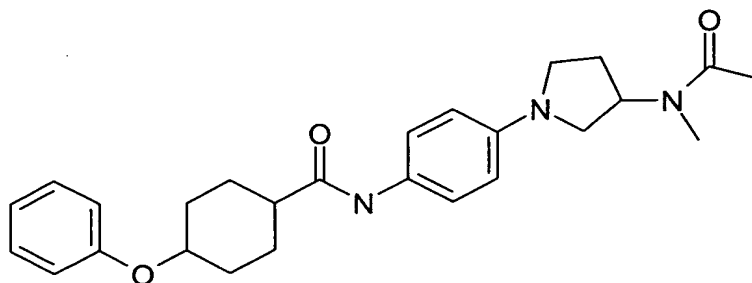
0.875 g of 4-bromofluorobenzene, 0.016 g of Pd(dba)₃·CHCl₃, 0.022 g 2-(dicyclohexylphosphino)biphenyl and 2.28 g of cesium carbonate were put in a heat-dried and argon-flushed flask, and 0.943 g of ethyl 4-piperidinecarboxylate in 5 ml of degassed toluene was added. The solution was heated at 100°C overnight. The mixture was cooled and then concentrated in vacuo. The residue was taken up in ethyl acetate/water. The organic phase was washed with 10% NaHCO₃ solution, dried over sodium sulfate and concentrated in vacuo. The residue was purified by preparative HPLC.

4.4 ml of a 2N potassium hydroxide solution were added to a solution of 1.1 g of ethyl 1-(4-fluorophenyl)piperidine-4-carboxylate in 100 ml of methanol. The mixture was stirred at room temperature overnight. The pH was then adjusted to 6 with 5% hydrochloric acid, and the solution was concentrated

in vacuo. The residue was purified by preparative HPLC.

Example 276

- 5 4-Phenoxycyclohexanecarboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}amide



- 0.251 g of PyBOP and 0.135 ml of triethylamine were added to a solution of 0.106 g of 4-phenoxycyclohexanecarboxylic acid and 0.113 g of N-[1-(4-aminophenyl)pyrrolidin-3-yl]-N-methylacetamide in 9 ml of DMF at 0°C. After 10 minutes, the solution was allowed to reach room temperature and was stirred at this temperature overnight. The solvent was then removed in vacuo, and the residue was taken up in water/ethyl acetate. The ethyl acetate phase was washed with 10% citric acid and 10% NaHCO₃ solution and dried over sodium sulfate, and the solvent was removed in vacuo. The residue was purified by preparative HPLC. The desired product was obtained. Molecular weight 435.25 (C₂₆H₃₃N₃O₃), MS: 436 (M+H⁺).

4-Phenoxycyclohexanecarboxylic acid

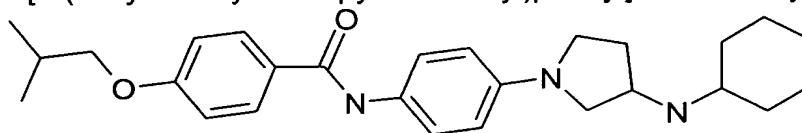
- 0.63 g of p-toluenesulfonyl chloride was added to a solution of 0.522 g of ethyl 4-hydroxycyclohexanecarboxylate in 5.0 ml of pyridine. The reaction was stirred at room temperature for 3 hours. The reaction mixture was concentrated in vacuo. The resulting solid was taken up in water and ethyl acetate, and the organic phase was washed three times with 2N hydrochloric acid and once with saturated NaCl solution. The organic phase was dried over sodium sulfate and concentrated in vacuo. The resulting product was employed without further purification in the next step. The resulting product (0.55 g) was dissolved in 11.2 ml of DMF, and 0.159 g of phenol and 0.549 g of cesium carbonate were added. The solution was

then heated at 80°C for 6 hours. After cooling, the mixture was concentrated in vacuo and purified by column chromatography on silica gel (eluent: ethyl acetate /n-heptane 1:1). The desired product was obtained. Molecular weight 248.32 (C₁₅H₂₀O₃), MS: 249 (M+H⁺).

- 5 0.06 ml of 2N potassium hydroxide solution was added to a solution of 0.12 g of ethyl 4-phenoxy cyclohexanecarboxylate in 8 ml of water/THF (1:1). The solution was heated at 60°C for 3 hours. Ethyl acetate and 10% citric acid were added to the mixture. The aqueous phase was extracted three times with ethyl acetate, dried over sodium sulfate and concentrated in
10 vacuo. The resulting compound was employed without further purification in the next stage.

Example 277

- 15 N-[4-(3-Cyclohexylaminopyrrolidin-1-yl)phenyl]-4-isobutoxybenzamide



Method N

- (4-Isobutoxy-N-[4-(3-oxopyrrolidin-1-yl)phenyl]benzamide (50 mg) in methanol (2 ml) was mixed with aminocyclohexane (28 mg) and glacial
20 acetic acid (10 mg), and a solution of sodium cyanoborohydride (1M in toluene; 0.17 ml) was added. After 8 hours, the reaction solution was concentrated and partitioned between ethyl acetate and water. The organic phase was dried over magnesium sulfate and concentrated. The crude product was purified by preparative HPLC. This resulted in the product with
25 the molecular weight of 435.61 (C₂₇H₃₇N₃O₂); MS (ESI): 436 (M+H⁺).

4-Isobutoxy-N-[4-(3-oxopyrrolidin-1-yl)phenyl]benzamide

- 4-Isobutoxybenzoic acid was reacted with 4-(1,4-dioxo-7-azaspiro[4.4]non-7-yl)phenylamine by method E-a. The resulting amide (0.25 g) in acetone
30 (10 ml) was mixed with para-toluene sulfonic acid (monohydrate, 109 mg), and the mixture was boiled under reflux for 8 hours. After adding triethylamine (0.5 ml), the mixture was diluted with water and extracted with ethyl acetate. The organic phase was dried over magnesium sulfate and concentrated. This resulted in the product with the molecular weight of

352.44 (C₂₁H₂₄N₂O₃); MS (ESI): 353 (M+H⁺).

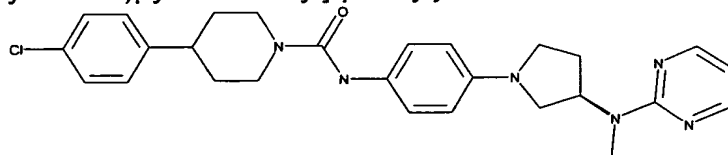
- 4-Butoxy-N-[4-(3-oxopyrrolidin-1-yl)-phenyl]benzamide was obtained using 4-butoxybenzoic acid in an analogous way. Likewise, 4-butoxybenzoic acid and 4-(1,4-dioxo-7-azaspiro[4.4]non-7-yl)-3-fluorophenylamine initially
 5 resulted in 4-butoxy-N-[4-(1,4-dioxo-7-azaspiro[4.4]non-7-yl)-3-fluorophenyl]benzamide which, after methylation by method F and treatment with para-toluenesulfonic acid as described above, afforded 4-butoxy-N-[3-fluoro-4-(3-oxopyrrolidin-1-yl)phenyl]benzamide.

4-(1,4-Dioxo-7-azaspiro[4.4]non-7-yl)phenylamine

- 10 Trimethylchlorosilane (9.3 g) was slowly added to a solution of 1-benzyl-3-pyrrolidinone (5.0 g) in dichloromethane (30 ml) and ethylene glycol (2.67 g). After 18 hours, the mixture was poured into sodium hydroxide solution (1N). The organic phase was separated off, dried over magnesium sulfate and concentrated. The residue was dissolved in methanol (30 ml) and
 15 ammonium formate (5.2 g) and palladium hydroxide (10% on carbon, 300 mg) were added. The mixture was boiled under reflux for 8 hours, filtered and concentrated. The residue was reacted with 4-fluoronitrobenzene by method C. Hydrogenation was finally carried out by method B. This resulted in the product with the molecular weight of 220.27 (C₁₂H₁₆N₂O₂);
 20 MS (ESI): 221 (M+H⁺).
 4-(1,4-Dioxo-7-azaspiro[4.4]non-7-yl)-3-fluorophenylamine was obtained analogously using 3,4-difluoronitrobenzene.

25 Example 278

(R)-4-(4-Chlorophenyl)piperidin-1-carboxylic acid {4-[3-(methylpyrimidin-2-yl-amino)pyrrolidin-1-yl]-phenyl}amide

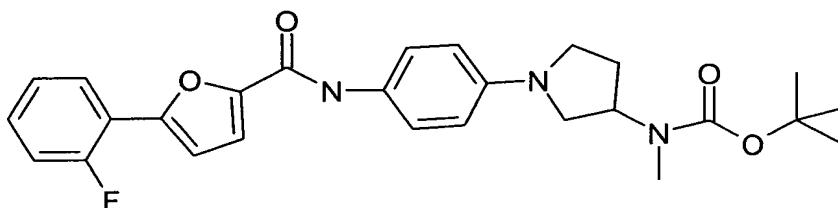


- (R)-4-(4-Chlorophenyl)piperidine-1-carboxylic acid [4-(3-methylaminopyrrolidin-1-yl)phenyl]amide (100 mg) was reacted with
 30 potassium carbonate (100 mg) and 2-bromopyrimidine (50 mg) in N-methylpyrrolidone (3 ml) at 100°C for 4 hours. The reaction solution was then partitioned between ethyl acetate and water. The organic phase was dried over magnesium sulfate and concentrated. The crude product was

purified by preparative HPLC. This resulted in the product with the molecular weight of 491.04 (C₂₇H₃₁ClN₆O); MS (ESI): 491 (M+H⁺).

5 Example 279

tert-Butyl [1-(4-[[5-(2-fluorophenyl)furan-2-carbonyl]amino]phenyl)pyrrolidin-3-yl]methylcarbamate



10 Method O

Tetrakis(triphenylphosphine)palladium(0) (20 mg) was added to a solution of tert-butyl (1-{4-[(5-bromofuran-2-carbonyl)amino]phenyl}pyrrolidin-3-yl)methylcarbamate (252 mg) in degassed toluene (4 ml) under argon in a 10 ml two-necked flask and stirred at room temperature for 10 minutes.

15 Then a solution of 2-fluorobenzeneboronic acid (73 mg in 1 ml of ethanol) and 0.35 ml of 2M sodium carbonate solution were added, and the mixture was stirred at 100°C for 24 hours.

Then water (5 ml) and ethyl acetate (5 ml) were added to the reaction mixture, the organic phase was separated off, and the aqueous phase was

20 extracted 2 × with ethyl acetate (10 ml). The combined organic phases were concentrated and the residue was purified by preparative HPLC. The desired product with the molecular weight of 479.56 (C₂₇H₃₀FN₃O₄); MS (ESI): 480 (M+H⁺) was obtained as hydrotrifluoroacetate. It is alternatively possible to use cesium carbonate as base and to heat the reaction at

25 150°C in a microwave apparatus for 3 minutes.

tert-Butyl (1-{4-[(5-bromofuran-2-carbonyl)amino]phenyl}pyrrolidin-3-yl)methylcarbamate

5-Bromofuran-2-carboxylic acid was reacted with tert-butyl [1-(4-aminophenyl)pyrrolidin-3-yl]methylcarbamate by method E. This resulted in

30

the product with the molecular weight of 464.36 (C₂₁H₂₆BrN₃O₄); MS (ESI): 464 (M+H⁺).

The following compounds were prepared analogously:

5 5-Bromofuran-2-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide

tert-Butyl (1-{4-[(5-bromothiophene-2-carbonyl)amino]phenyl}pyrrolidin-3-yl)methylcarbamate

2-Bromothiazole-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide

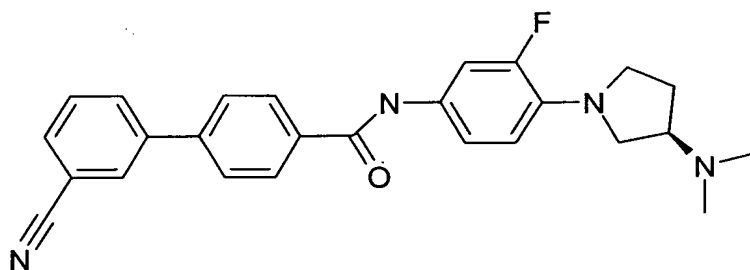
10 4-Iodo-N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]benzamide

(R)-N-[4-(3-Dimethylaminopyrrolidin-1-yl)-3-fluorophenyl]-4-iodobenzamide

4-Bromo-N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]-3-fluorobenzamide

15 Example 280

(3R)-3'-Cyanobiphenyl-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)-3-fluorophenyl]amide



Method O-b

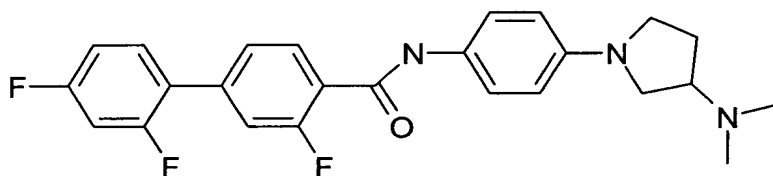
20 0.002 mg of Pd(PPh₃)₄ were added to a solution of 0.022 g of (R)-N-[4-(3-dimethylaminopyrrolidin-1-yl)-3-fluorophenyl]-4-iodobenzamide in 0.45 ml of degassed DMF and stirred at room temperature for 10 minutes. 0.035 ml of water, 0.021 g of K₃PO₄ and 0.008 g of 3-cyanophenylboronic acid were then added to the solution. The reaction solution was heated at 80°C

25 overnight. The solution was then filtered and purified by preparative HPLC. This resulted in the product with the molecular weight of 428.20

(C₂₆H₂₅FIN₄O); MS (ESI): 429 (M+H⁺) as hydrotrifluoroacetate.

Example 281

- 5 3,2',4'-Trifluorobiphenyl-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]-amide



- 10 1-Bromo-2,4-difluorobenzene was reacted with N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]-2-fluoro-4-boronic acid benzamide by method O-b. This resulted in the product with the molecular weight of 439.19 (C₂₅H₂₄F₃N₃O); MS (ESI): 440 (M+H⁺) as hydrotrifluoroacetate.

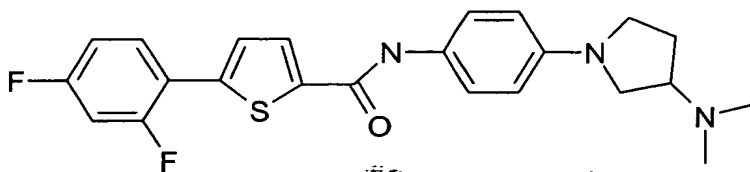
N-[4-(3-Dimethylaminopyrrolidin-1-yl)phenyl]-2-fluoro-4-boronic acid benzamide

- 15 4-Carboxy-3-fluorophenylboronic acid was reacted with [1-(4-aminophenyl)pyrrolidin-3-yl]dimethylamine by method E-b. This resulted in the product with the molecular weight of 371.18 (C₁₉H₂₃BFN₃O₃); MS (ESI): 372 (M+H⁺) as hydrotrifluoroacetate.

20

Example 282

5-(2,4-Difluorophenyl)thiophen-2-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)-phenyl]amide



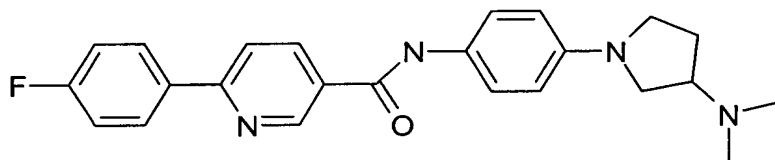
- 25 1-Bromo-2,4-difluorobenzene was reacted with 2-boronic acid thiophen-5-

carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide by method O-b. This resulted in the product with molecular weight of 427.52 (C₂₃H₂₃F₂N₃OS); MS (ESI): 428 (M+H⁺) as hydrotrifluoroacetate.

- 5 2-Boronic acid thiophene-5-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide
5-Carboxy-2-thiopheneboronic acid was reacted with [1-(4-aminophenyl)pyrrolidin-3-yl]-dimethylamine by method E-b. This resulted in the product with the molecular weight of 359.15 (C₁₇H₂₂BN₃O₃S); MS
10 (ESI): 360 (M+H⁺) as hydrotrifluoroacetate.

Example 283

- 15 N-[4-(3-Dimethylaminopyrrolidin-1-yl)phenyl]-6-(4-fluorophenyl)nicotinamide



- 5-[4-(3-Dimethylaminopyrrolidin-1-yl)phenylcarbamoyl]pyridin-2-yl [trifluoromethanesulfonate] was reacted with 4-fluorobenzeneboronic acid under the conditions of method O-b. (Heating at 140°C in a microwave apparatus for
20 15 minutes). This resulted in the product with the molecular weight of 404.20 (C₂₄H₂₅FN₄O); MS (ESI): 405 (M+H⁺) as hydrotrifluoroacetate.

5-[4-(3-Dimethylaminopyrrolidin-1-yl)phenylcarbamoyl]pyridin-2-yl
[trifluoromethanesulfonate]

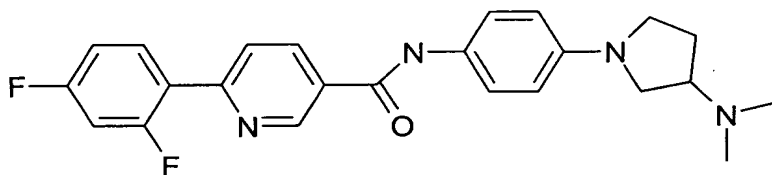
- 25 A suspension of 0.05 g of N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]-6-hydroxynicotinamide in 0.4 ml of DME was added to a solution of 0.084 ml of LDA solution (2M) in 0.4 ml of DME at 0°C. The mixture was stirred at 0°C for 2 hours. A solution of 0.055 g of N-phenyltrifluoromethanesulfonimide in 0.2 ml of DME was then added to the
30 mixture. The reaction solution was allowed to reach room temperature and

was heated at 80°C for 3 hours. After cooling, the solution was concentrated in vacuo. The residue was taken up in ethyl acetate/water, and the aqueous phase was extracted three times with ethyl acetate. The combined organic phases were dried over sodium sulfate, concentrated in vacuo and purified by preparative HPLC.

N-[4-(3-Dimethylaminopyrrolidin-1-yl)-phenyl]-6-hydroxynicotinamide
6-Hydroxynicotinic acid was reacted with [1-(4-aminophenyl)pyrrolidin-3-yl]dimethylamine by method E-b. This resulted in the product with the molecular weight of 326.17 (C₁₈H₂₂N₄O₂); MS (ESI): 327 (M+H⁺) as hydrotrifluoroacetate.

Example 284

N-[4-(3-Dimethylaminopyrrolidin-1-yl)phenyl]-6-(2,4-difluorophenyl)nicotinamide

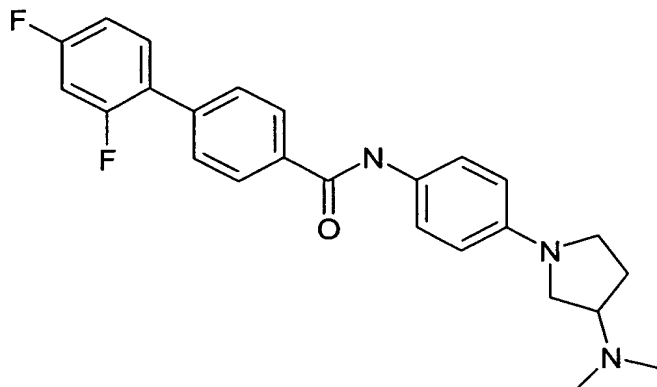


2,4-Difluorophenylboronic acid was reacted with 5-[4-(3-dimethylaminopyrrolidin-1-yl)-phenylcarbamoyl]pyridin-2-yl [trifluoromethanesulfonate by method O-b. This resulted in the product with the molecular weight of 422.00 (C₂₄H₂₄F₂N₄O); MS (ESI): 423 (M+H⁺) as hydrotrifluoroacetate.

25

Example 285

2',4'-Difluorobiphenyl-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide



2',4'-Difluorobiphenyl-4-carboxylic acid was reacted with [1-(4-aminophenyl)pyrrolidin-3-yl]dimethylamine by method E-a. This resulted in the product with the molecular weight of 421.20 (C₂₅H₂₅F₂N₃O); MS (ESI): 422 (M+H⁺) as hydrotrifluoroacetate.

2',4'-Difluorobiphenyl-4-carboxylic acid

Method P

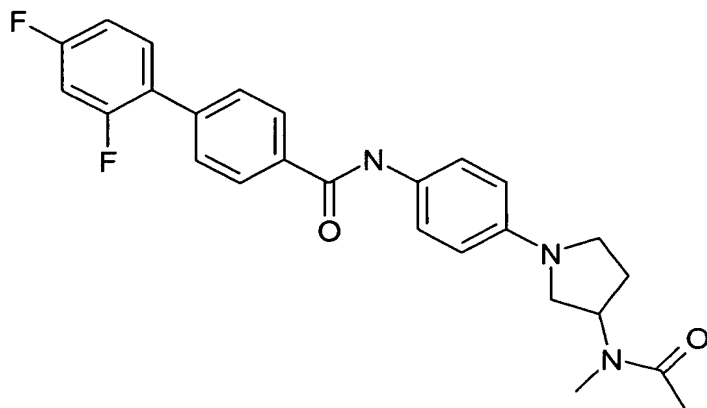
0.098 ml of 1 N lithium hydroxide solution was added to a solution of 0.051 g of ethyl 2',4'-difluorobiphenyl-4-carboxylate in 1 ml THF/water (1:1), and the mixture was stirred at room temperature overnight. 5% hydrochloric acid was used to neutralize the solution, which was concentrated in vacuo, and the residue was purified by preparative HPLC.

15 Ethyl 2',4'-difluorobiphenyl-4-carboxylate

0.009 g of Pd(PPh₃)₄ was added to a solution of 0.091 g of ethyl 4-iodobenzoate in 0.96 ml of degassed toluene and stirred at room temperature for 10 minutes. Then a solution of 0.047 g of 2,4-difluorophenylboronic acid in 0.114 ml of ethanol and 0.201 ml of a 2N Na₂CO₃ solution was added to the reaction solution. The solution was heated at 100°C overnight. The reaction mixture was then concentrated in vacuo, and water/ethyl acetate were added to the residue. The aqueous phase was extracted three times with ethyl acetate and dried over sodium sulfate, and the solvent was removed in vacuo and purified by preparative HPLC.

Example 286

2',4'-Difluorobiphenyl-4-carboxylic acid {4-[3-(acetylmethylamino)pyrrolidin-1-yl]phenyl}-amide

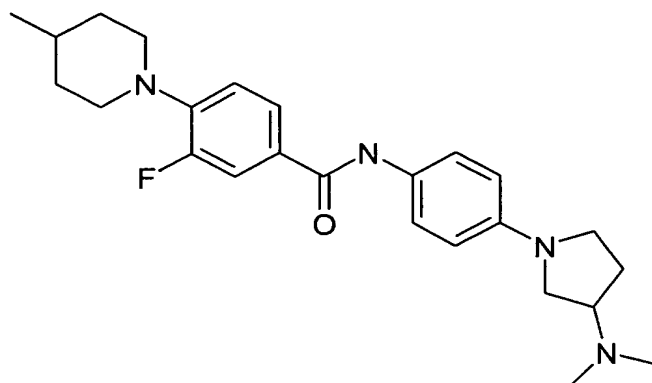


5 Method E-b

0.095 g of HATU, 0.068 g of HOBT and 0.035 ml of triethylamine were added to a solution of 0.047 g of 2',4'-difluorobiphenyl-4-carboxylic acid and 0.058 g of N-[1-(4-aminophenyl)pyrrolidin-3-yl]-N-methylacetamide in 2 ml of DMF at 0°C. After 10 minutes, the solution was allowed to reach room temperature and was stirred at this temperature overnight. The solvent was then removed in vacuo, and the residue was taken up in water/ethyl acetate. The ethyl acetate phase was washed with 10% NaHCO₃ solution and water. The ethyl acetate phase was dried over sodium sulfate, and the solvent was removed in vacuo. The residue was purified by preparative HPLC. The desired product was obtained. Molecular weight 449.19 (C₂₆H₂₅F₂N₃O₂), MS: 450 (M+H⁺).

Example 287

20 N-[4-(3-Dimethylaminopyrrolidin-1-yl)phenyl]-3-fluoro-4-(4-methylpiperidin-1-yl)-benzamide



3-Fluoro-4-(4-methylpiperidin-1-yl)benzoic acid was reacted with [1-(4-aminophenyl)-pyrrolidin-3-yl]dimethylamine by method E-a. This resulted in the product with the molecular weight of 424.00 (C₂₅H₃₃FN₄O); MS (ESI): 425 (M+H⁺) as hydrotrifluoroacetate.

3-Fluoro-4-(4-methylpiperidin-1-yl)benzoic acid

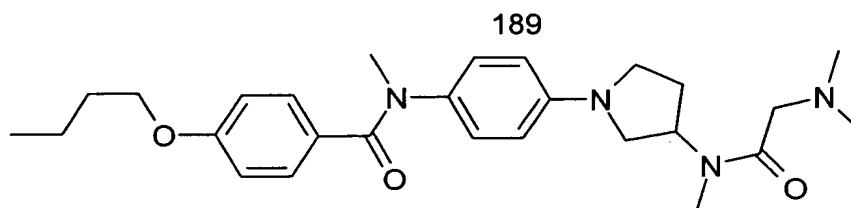
Methyl 3-fluoro-4-(4-methylpiperidin-1-yl)benzoate was treated with lithium hydroxide by method P. This resulted in the product with the molecular weight of 237.28 (C₁₃H₁₆FNO₂); MS (ESI): 238 (M+H⁺).

Methyl 3-fluoro-4-(4-methylpiperidin-1-yl)benzoate

0.076 g of potassium carbonate was added to a solution of 0.086 g of methyl 3,4-difluorobenzoate and 0.050 g of 4-methylpiperidine in 0.5 ml of DMF. The reaction was heated at 60°C for 2 days, filtered and purified by preparative HPLC. This resulted in the product with the molecular weight of 251.3 (C₁₄H₁₈FNO₂); MS (ESI): 252 (M+H⁺) as hydrotrifluoroacetate.

Example 288

4-Butoxy-N-(4-{3-[(2-dimethylaminoacetyl)methylamino]pyrrolidin-1-yl}phenyl)-N-methylbenzamide

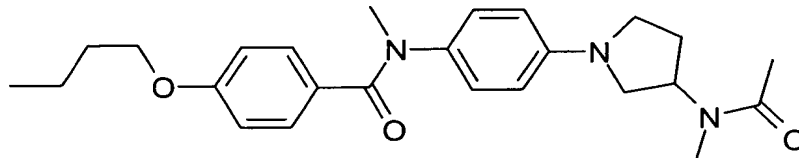


4-Butoxy-N-methyl-N-[4-(3-methylaminopyrrolidin-1-yl)phenyl]benzamide was reacted with N,N-dimethylglycine by method E. This resulted in the product with the molecular weight of 466.63 (C₂₇H₃₈N₄O₃); MS (ESI): 467 (M+H⁺).

(R)-4-Butoxy-N-(4-{3-[(2-dimethylaminoacetyl)methylamino]pyrrolidin-1-yl}phenyl)-N-methylbenzamide was obtained analogously.

10 Example 289

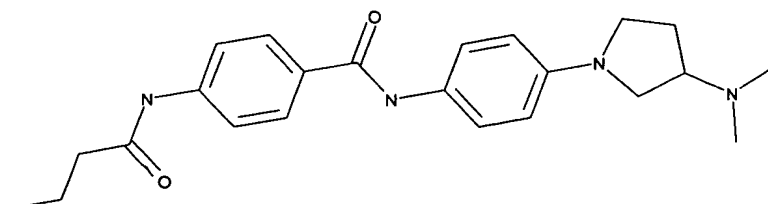
N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-4-butoxy-N-methylbenzamide



4-Butoxy-N-methyl-N-[4-(3-methylaminopyrrolidin-1-yl)phenyl]benzamide was mixed with pyridine and acetic anhydride. Volatile fractions were removed after 2 hours. This resulted in the product with the molecular weight of 423.56 (C₂₅H₃₃N₃O₃); MS (ESI): 424 (M+H⁺).

20 Example 290

4-Butyrylamino-N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]benzamide



Method Q

4-Amino-N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]benzamide (32 mg) in dichloromethane (2 ml) was mixed with potassium carbonate (50 mg) and butyryl chloride (11 mg). The mixture was filtered and concentrated after 12 hours. The residue was purified by preparative HPLC. This resulted in the product with the molecular weight of 394.52 (C₂₃H₃₀N₄O₃); MS (ESI): 395 (M+H⁺).

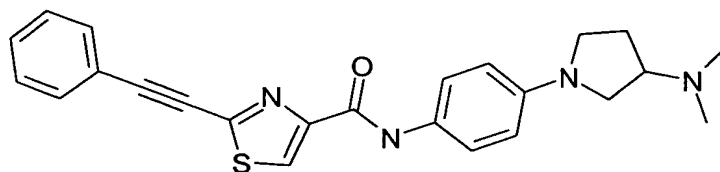
An alternative possibility is to react 4-amino-N-[4-(3-dimethylaminopyrrolidin-1-yl)-phenyl]benzamide with butyric acid by method E.

4-Amino-N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]benzamide

4-tert-Butoxycarbonylaminobenzoic acid was reacted with 1-(4-aminophenyl)pyrrolidin-3-yl]dimethylamine by method E, and the product was treated by method G. This resulted in the product with the molecular weight of 324.43 (C₁₉H₂₄N₄O); MS (ESI): 325 (M+H⁺).

Example 291

2-Phenylethynylthiazole-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]-amide

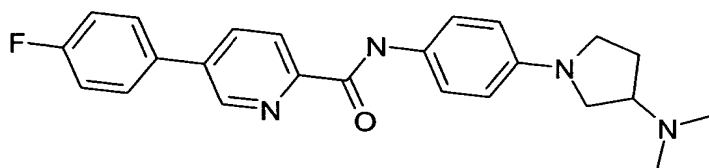


2-Bromothiazole-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide (100 mg) was dissolved in tetrahydrofuran (2 ml), and phenylacetylene (52 mg), triethylamine (52 mg), triphenylphosphine (17 mg), bis(triphenylphosphine)palladium dichloride (89 mg) and copper (I) iodide (9.6 mg) were added. The reaction mixture was heated at 150°C in a microwave apparatus for 3 minutes and then concentrated. The residue was purified by preparative HPLC. This resulted in the product with the

molecular weight of 416.55 (C₂₄H₂₄N₄O₅); MS (ESI): 417 (M+H⁺).

Example 292

- 5 5-(4-Fluorophenyl)pyridine-2-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]-amide



Method O-a

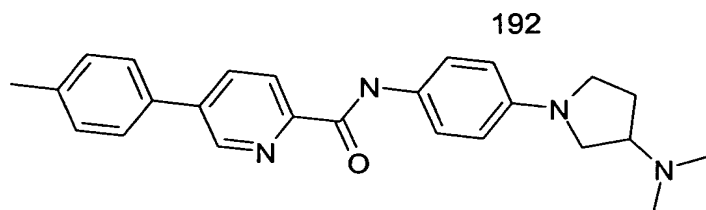
- 5-Chloropyridine-2-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide (100 mg) dissolved in toluene was mixed with 4-fluorophenylboronic acid (81 mg), POPD (15 mg) and cesium carbonate (2M aq.; 0.5 ml). The reaction was heated at 150°C in a microwave apparatus for 10 minutes and then concentrated. The residue was purified by preparative HPLC. This resulted in the product with the molecular weight of 404.49 (C₂₄H₂₅FN₄O); MS (ESI): 405 (M+H⁺).

5-Chloropyridine-2-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide

- 20 [1-(4-Aminophenyl)pyrrolidin-3-yl]dimethylamine was reacted with 5-chloropyridine-2-carboxylic acid by method E. This resulted in the product with the molecular weight of 344.85 (C₁₈H₂₁ClN₄O); MS (ESI): 345 (M+H⁺).

25 Example 293

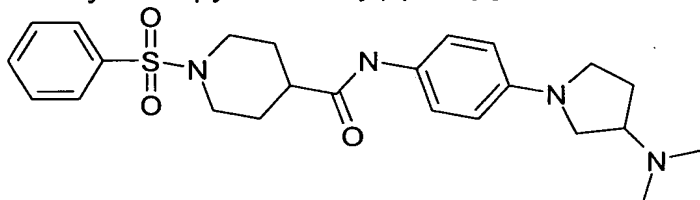
- 5-(4-Fluorophenyl)pyridine-2-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]-amide



5-Chloropyridine-2-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide was reacted with 4-methylphenylboronic acid by method O-a. This resulted in the product with the molecular weight of 400.53 (C₂₅H₂₈N₄O); MS (ESI): 401 (M+H⁺).

Example 294

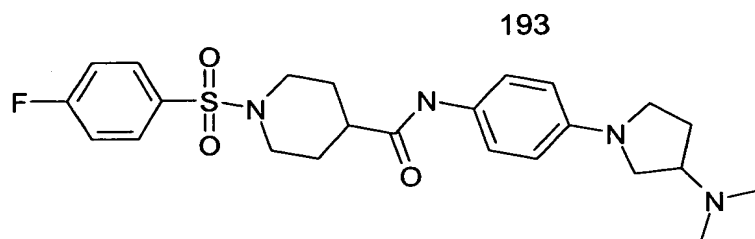
10 1-Benzenesulfonylpiperidine-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)-phenyl]amide



Piperidine-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide (70 mg) dissolved in N-methylpyrrolidone (2 ml) was mixed with potassium carbonate (45 mg) and benzenesulfonyl chloride (35 mg).
 15 After 12 hours, the mixture was filtered and the filtrate was purified by preparative HPLC. This resulted in the product with the molecular weight of 456.61 (C₂₄H₃₂N₄O₃S); MS (ESI): 457 (M+H⁺).

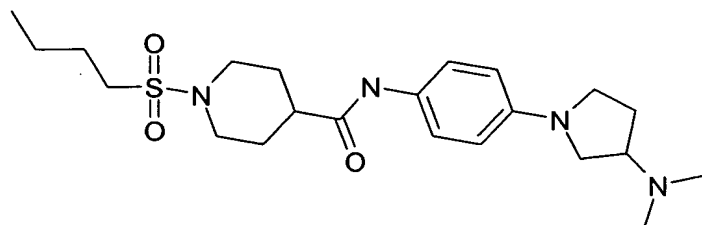
20 Example 295

1-(4-Fluorobenzenesulfonyl)piperidine-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide



Piperidine-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide (70 mg) dissolved in N-methylpyrrolidone (2 ml) was mixed with potassium carbonate (45 mg) and 4-fluorobenzenesulfonyl chloride (40 mg). After 12 hours, the mixture was filtered and the filtrate was purified by preparative HPLC. This resulted in the product with the molecular weight of 474.60 (C₂₄H₃₁FN₄O₃S); MS (ESI): 475 (M+H⁺).

Example 296
 10 1-(Butane-1-sulfonyl)piperidine-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)-phenyl]amide

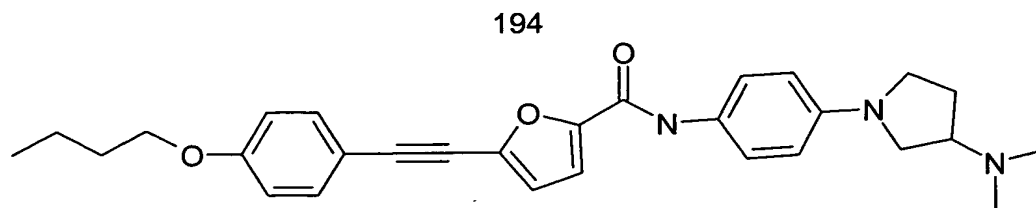


Piperidine-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide (70 mg) dissolved in N-methylpyrrolidone (2 ml) was mixed with potassium carbonate (45 mg) and butylsulfonyl chloride (30 mg). After 12 hours, the mixture was filtered and the filtrate was purified by preparative HPLC. This resulted in the product with the molecular weight of 436.62 (C₂₂H₃₆N₄O₃S); MS (ESI): 437 (M+H⁺).

20

Example 297

5-(4-Butoxyphenylethynyl)furan-2-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)-phenyl]amide

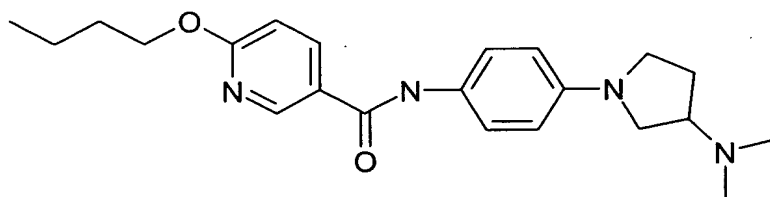


Method J-a

5-Bromofuran-2-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide (75 mg) was dissolved together with 1-butoxy-4-ethynylbenzene (35 mg) in N,N-dimethylformamide (1 ml) and, under argon, added dropwise to a suspension of Pd(tBu3P)2Cl2 (4 mg), copper (I) iodide (75 mg) and N,N-diisopropylamine (20 mg) in anhydrous tetrahydrofuran (3 ml). The mixture was stirred at room temperature for 8 hours. The reaction was worked up by filtration through a syringe filter and concentrated, and the crude product was purified by preparative HPLC. This resulted in the product with the molecular weight of 471.6 (C₂₉H₃₃N₃O₃); MS (ESI): 472 (M+H⁺) as hydrotrifluoroacetate.

Example 298

6-Butoxy-N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]nicotinamide



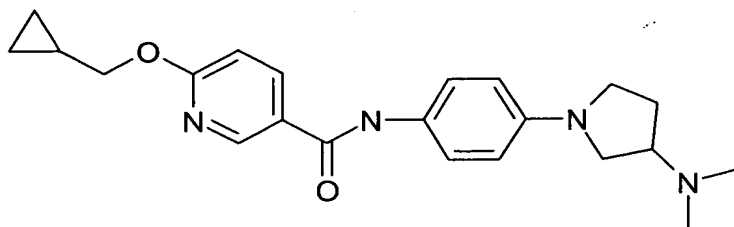
Method H-a

A solution of 0.1 g of potassium hydroxide in 1 ml of DMSO was stirred at room temperature for 10 minutes and then 0.1 g of N-[4-(3-dimethylaminopyrrolidin-1-yl)-phenyl]-6-hydroxynicotinamide was added. The reaction solution was stirred for 10 minutes and then 0.084 g of 1-bromobutane was added. The mixture was stirred at room temperature overnight. After addition of water and ethyl acetate, the aqueous phase was extracted three times with ethyl acetate. The combined organic phases were dried over sodium sulfate, concentrated in vacuo and purified by

preparative HPLC. This resulted in the product with the molecular weight of 382.24 (C₂₂H₃₀N₄O₂); MS (ESI): 383 (M+H⁺) as hydrotrifluoroacetate.

5 Example 299

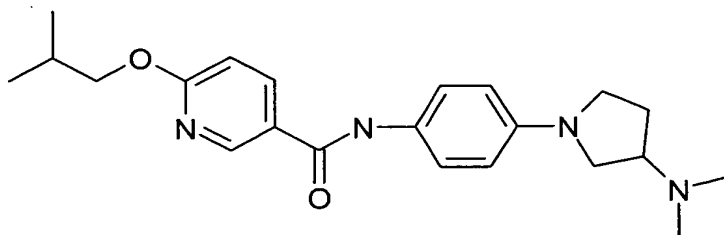
6-Cyclopropylmethoxy-N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]nicotinamide



(Bromomethyl)cyclopropane was reacted with N-[4-(3-dimethylaminopyrrolidin-1-yl)-phenyl]-6-hydroxynicotinamide by method H-
 10 a. This resulted in the product with the molecular weight of 380.22 (C₂₂H₂₈N₄O₂); MS (ESI): 381 (M+H⁺) as hydrotrifluoroacetate.

15 Example 300

N-[4-(3-Dimethylaminopyrrolidin-1-yl)phenyl]-6-isobutoxynicotinamide

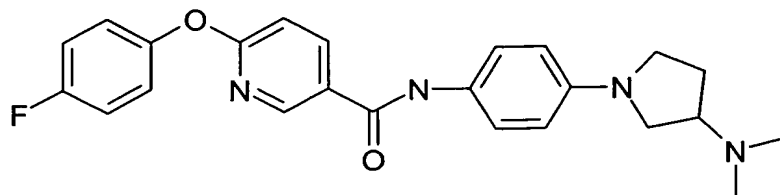


1-Bromo-2-methylpropane was reacted with N-[4-(3-dimethylaminopyrrolidin-1-yl)-phenyl]-6-hydroxynicotinamide by method H-
 20 a. This resulted in the product with the molecular weight of 382.24 (C₂₂H₃₀N₄O₂); MS (ESI): 383 (M+H⁺) as hydrotrifluoroacetate.

Example 301

25 N-[4-(3-Dimethylaminopyrrolidin-1-yl)phenyl]-6-(4-

fluorophenoxy)nicotinamide



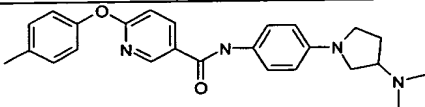
49 mg of potassium carbonate were added to a solution of 0.041 g of 6-chloro-N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]nicotinamide and 4-fluorophenol (30 mg) in 0.8 ml of DMF, and the reaction was heated at 140°C in a microwave apparatus for 90 minutes. After addition of water and ethyl acetate, the aqueous phase was extracted three times with ethyl acetate. The combined organic phases were dried over sodium sulfate, concentrated in vacuo and purified by preparative HPLC. This resulted in the product with the molecular weight of 420.2 (C₂₄H₂₅FN₄O₂); MS (ESI): 421 (M+H⁺) as hydrotrifluoroacetate.

6-Chloro-N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]nicotinamide

6-Chloronicotinic acid was reacted with [1-(4-amino-phenyl)pyrrolidin-3-yl]dimethylamine by method E-b. This resulted in the product with the molecular weight of 344.14 (C₁₈H₂₁ClN₄O); MS (ESI): 345 (M+H⁺) as hydrotrifluoroacetate.

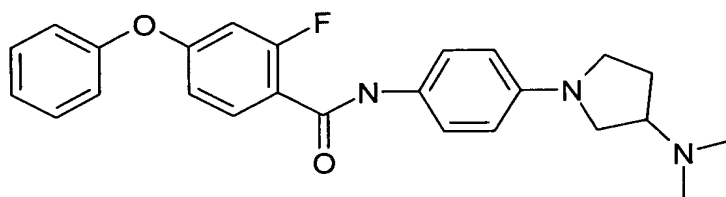
The following examples were prepared analogously.

Ex. No.	Structure	Molecular formula	Molecular weight	M+H ⁺
302		C ₂₄ H ₂₆ N ₄ O ₂	402.21	403
303		C ₂₄ H ₂₅ ClN ₄ O ₂	436.17	437

304		C ₂₅ H ₂₈ N ₄ O ₂	416.22	417
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Example 305

N-[4-(3-Dimethylaminopyrrolidin-1-yl)phenyl]-2-fluoro-4-phenoxybenzamide



5

Powdered molecular sieves (4 A), 0.01 g of copper acetate and 0.02 g of N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]-2-fluoro-4-boronic acid benzamide were added to a solution of 0.008 g of phenol in 0.5 ml of methylene chloride and stirred at 40°C for 24 hours. The solvent was then removed in vacuo, the residue was taken up in water/ethyl acetate, and the aqueous phase was extracted three times with ethyl acetate. The combined organic phases were dried over sodium sulfate, concentrated in vacuo and purified by preparative HPLC. This resulted in the product with the molecular weight of 419.2 (C₂₅H₂₆FN₃O₂); MS (ESI): 420 (M+H⁺) as hydrotrifluoroacetate.

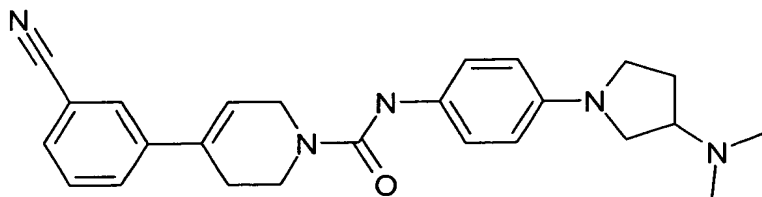
15

N-[4-(3-Dimethylaminopyrrolidin-1-yl)phenyl]-2-fluoro-4-boronic acid benzamide

4-Carboxy-3-fluorophenylboronic acid was reacted with [1-(4-aminophenyl)pyrrolidin-3-yl]dimethylamine by method E-b. This resulted in the product with the molecular weight of 371.18 (C₁₉H₂₃BFN₃O₃); MS (ESI): 372 (M+H⁺) as hydrotrifluoroacetate.

20

4-(3-Cyanophenyl)-3,6-dihydro-2H-pyridine-1-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide

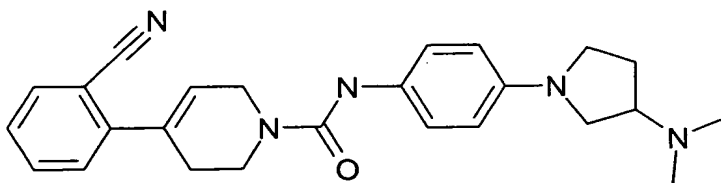


5 4-(4,4,5,5-Tetramethyl-[1,3,2]dioxaborolan-2-yl)-3,6-dihydro-2H-pyridine-1-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide was reacted with 3-bromobenzonitrile by method O-a. This resulted in the product with the molecular weight of 415.54 (C₂₅H₂₉N₅O); MS (ESI): 416 (M+H⁺)

10 4-(4,4,5,5-Tetramethyl-[1,3,2]dioxaborolan-2-yl)-3,6-dihydro-2H-pyridine-1-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide
4-(4,4,5,5-Tetramethyl-[1,3,2]dioxaborolan-2-yl)-1,2,3,6-tetrahydropyridine was reacted with [1-(4-aminophenyl)pyrrolidin-3-yl]dimethylamine by method A. This resulted in the product with the molecular weight of 440.40
15 (C₂₄H₃₇BN₄O₃); MS (ESI): 441 (M+H⁺)

Example 307

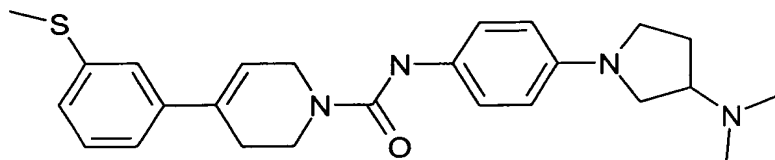
20 4-(2-Cyanophenyl)-3,6-dihydro-2H-pyridine-1-carboxylic acid [4-(3-dimethylamino-pyrrolidin-1-yl)phenyl]amide



25 4-(4,4,5,5-Tetramethyl-[1,3,2]dioxaborolan-2-yl)-3,6-dihydro-2H-pyridine-1-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide was reacted with 2-bromobenzonitrile by method O-a. This resulted in the product with the molecular weight of 415.54 (C₂₅H₂₉N₅O); MS (ESI): 416 (M+H⁺)

Example 308

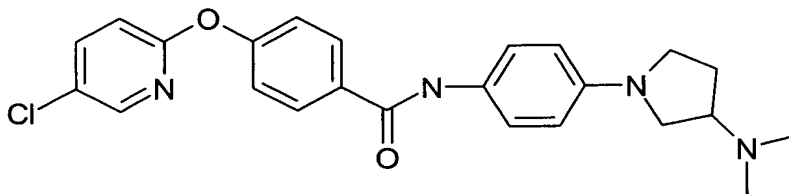
4-(3-Methylsulfanylphenyl)-3,6-dihydro-2H-pyridine-1-carboxylic acid [4-(3-
5 dimethylaminopyrrolidin-1-yl)phenyl]amide



4-(4,4,5,5-Tetramethyl-[1,3,2]dioxaborolan-2-yl)-3,6-dihydro-2H-pyridine-1-
carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide was
reacted with 3-bromothioanisole by method O-a. This resulted in the
10 product with the molecular weight of 436.62 (C₂₅H₃₂N₄O₂S); MS (ESI):
437 (M+H⁺)

Example 309

15 4-(5-Chloropyridin-2-yloxy)-N-[4-(3-dimethylaminopyrrolidin-1-
yl)phenyl]benzamide



0.143 g of potassium carbonate was added to a solution of 0.19 g of 4-[4-
(3-dimethylaminopyrrolidin-1-yl)phenylcarbonyl]phenyl acetate in 2 ml of
20 DMF, and the solution was heated at 130°C in a microwave apparatus for
15 minutes. The solution was then mixed with water and ethyl acetate, the
aqueous phase was freeze-dried, and the residue was employed without
further purification in the next stage.

25 Method R

A solution of 0.05 g of N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]-4-
hydroxybenzamide, 0.017 g of 2,5-dichloropyridine and 0.064 g of

potassium carbonate in 0.8 ml of DMF was heated at 230°C in a microwave apparatus for 30 minutes. The solution was filtered and purified by preparative HPLC. This resulted in the product with the molecular weight of 436.17 (C₂₄H₂₅ClN₄O₂); MS (ESI): 437 (M+H⁺) as hydrotrifluoroacetate.

5

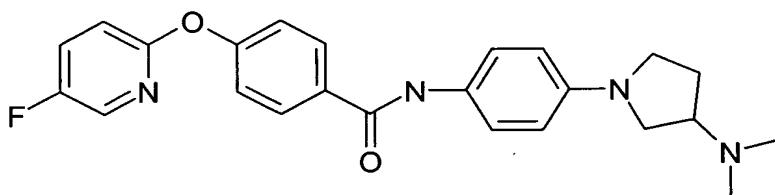
4-[4-(3-Dimethylaminopyrrolidin-1-yl)phenylcarbamoyl]phenyl acetate
4-Acetoxybenzoic acid was reacted with [1-(4-aminophenyl)pyrrolidin-3-yl]dimethylamine by method E-b. This resulted in the product with the molecular weight of 367.19 (C₂₁H₂₅N₃O₃); MS (ESI): 368 (M+H⁺) as hydrotrifluoroacetate.

10

Example 310

N-[4-(3-Dimethylaminopyrrolidin-1-yl)phenyl]-4-(5-fluoropyridin-2-yloxy)benzamide

15



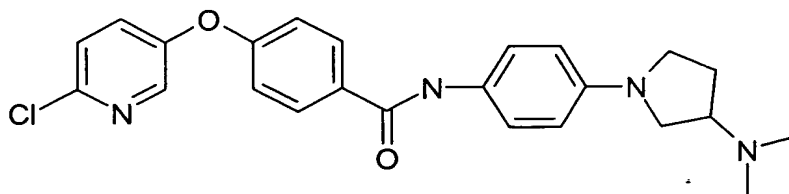
2-Chloro-5-fluoropyridine was reacted with N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]-4-hydroxybenzamide by method R. This resulted in the product with the molecular weight of 420.2 (C₂₄H₂₅FN₄O₂); MS (ESI): 421 (M+H⁺) as hydrotrifluoroacetate.

20

Example 311

4-(6-Chloropyridin-3-yloxy)-N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]benzamide

25

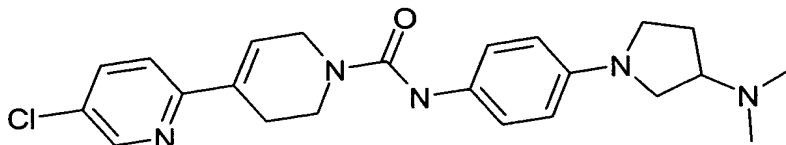


was obtained as by-product of the reaction in example 310. This resulted in

the product with the molecular weight of 436.95 (C₂₄H₂₅ClN₄O₂); MS (ESI): 437 (M+H⁺) as hydrotrifluoroacetate.

5 Example 312

5-Chloro-3',6'-dihydro-2'H-[2,4']bipyridinyl-1'-carboxylic acid [4-(3-dimethylamino-pyrrolidin-1-yl)phenyl]amide



[1-(4-Aminophenyl)pyrrolidin-3-yl]dimethylamine (32 mg) and carbonyldiimidazole (27.1 mg) were dissolved in acetonitrile (1.5 ml), and the mixture was stirred for 3 hours. Triethylamine (63.4 μ l) was added to a solution of 5-chloro-1',2',3',6'- tetrahydro-[2,4']bipyridine (40.7 mg) in THF (1 ml) and chloroform (0.5 ml). After 15 minutes, the mixture was added dropwise to the first solution and stirred overnight. The mixture was concentrated and the residue was partitioned between dichloromethane and water. The organic phase was dried over sodium sulfate, filtered and concentrated. Contamination by the primary and/or secondary amine was removed by dissolving the residue in dichloromethane (1.5 ml) and adding the solution to a stirred suspension of polymer-bound p-toluenesulfonyl chloride (0.5 g) in dichloromethane (6 ml) and triethylamine (128 μ l). After 3 hours, the resin was filtered off and washed several times with dichloromethane. The combined organic phases were concentrated. The residue was purified by chromatography (silica gel, mobile phase: ethyl acetate/dichloromethane (5%), ammonia (7N in methanol, 2%), later ethyl acetate/dichloromethane (5%), ammonia (7N in methanol, 3%). This resulted in the product with the molecular weight of 425.97 (C₂₃H₂₈ClN₅O); MS (ESI): 426 (M+H⁺).

5-Chloro-1',2',3',6'- tetrahydro-[2,4']bipyridine

30 A solution of tert-butyl 5-chloro-3',6'-dihydro-2'H-[2,4']bipyridine-1'-carboxylate (50 mg) in chloroform (2.4 ml) was mixed with hydrogen chloride (4N in dioxane; 0.8 ml) and the mixture was concentrated after 13

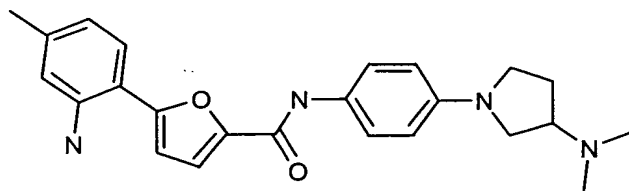
hours. This resulted in the product with the molecular weight of 194.67 (C₁₀H₁₁ClN₂); MS (ESI): 195 (M+H⁺).

tert-Butyl 5-chloro-3',6'-dihydro-2'H-[2,4']bipyridine-1'-carbamate

- 5 A solution of 2-bromo-5-chloropyridine (131 mg) in DMF (degassed with nitrogen; 4.5 ml) was added to a mixture of tert-butyl 4-(4,4,5,5-tetramethyl-[1,3,2]dioxaborolan-2-yl)-3,6-dihydro-2H-pyridin-1-carbamate (Eastwood, Paul R., *Tetrahedron Lett*, **41**, 19, 2000, 3705-3708; 200 mg), potassium carbonate (0.265 g) and Pd(dppf)Cl₂ (50 mg). The mixture was
- 10 heated at 80°C for 8 hours. After cooling, the mixture was diluted with dichloromethane and washed with sodium carbonate solution and water. The organic phase was dried over sodium sulfate, filtered and concentrated. The residue was purified by chromatography (silica gel, mobile phase: heptane/ethyl acetate (2%)/dichloromethane (5%), later
- 15 heptane/ethyl acetate (5%)/dichloromethane (5%).

Example 313

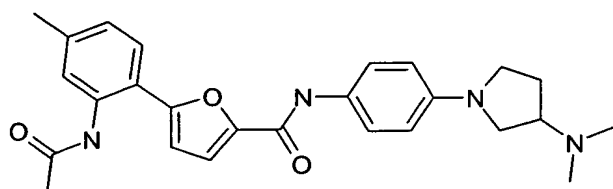
- 5-(2-Amino-4-methylphenyl)furan-2-carboxylic acid [4-(3-dimethylamino-pyrrolidin-1-yl)-phenyl]amide
- 20



- 5-(2-Nitro-4-methylphenyl)furan-2-carboxylic acid [4-(3-dimethylamino-pyrrolidin-1-yl)-phenyl]amide was hydrogenated by method B. This resulted in the product with the molecular weight of 404.22 (C₂₄H₂₈N₄O₂);
- 25 MS (ESI): 405 (M+H⁺).

Example 314

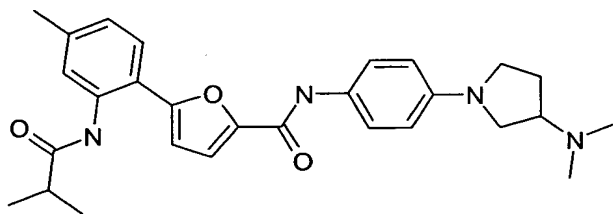
- 5-(2-Acetylamino-4-methylphenyl)furan-2-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide
- 30



5-(2-Amino-4-methylphenyl)furan-2-carboxylic acid [4-(3-dimethylamino-
pyrrolidin-1-yl)- phenyl]amide was reacted with acetyl chloride by method
Q. This resulted in the product with the molecular weight of 446.23
5 (C₂₆H₃₀N₄O₃); MS (ESI): 447 (M+H⁺).

Example 315

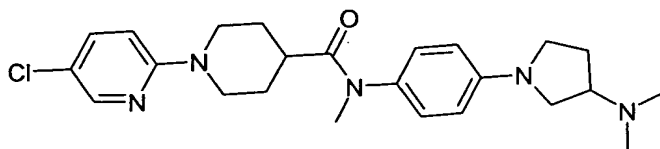
5-(2-Isobutyrylamino-4-methylphenyl)furan-2-carboxylic acid [4-(3-
10 dimethylamino- pyrrolidin-1-yl)phenyl]amide



5-(2-Amino-4-methylphenyl)furan-2-carboxylic acid [4-(3-dimethylamino-
pyrrolidin-1-yl)- phenyl]amide was reacted with isobutyryl chloride by
method Q. This resulted in the product with the molecular weight of 474.26
15 (C₂₈H₃₄N₄O₃); MS (ESI): 475 (M+H⁺).

Example 316

5'-Chloro-3,4,5,6-tetrahydro-2H-[1,2']bipyridinyl-4-carboxylic acid [4-(3-
20 dimethylamino- pyrrolidin-1-yl)phenyl]methanamide



Piperidine-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]-
methanamide (44.4 mg) and 2,5-dichloropyridine (60 mg) were heated at
160°C for 15 minutes. o-Xylene (0.5 ml) was added and heating at 160°C

was continued for 2 hours. The cooled crude mixture was purified by chromatography (silica gel, eluent: ethyl acetate/ammonia (7N in methanol)). This resulted in the product with the molecular weight of 442.01 (C₂₄H₃₂CIN₅O); MS (ESI): 442 (M+H⁺).

5

Piperidine-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]methanamide

tert-Butyl 4-[[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]methylcarbamoyl]-piperidine-1-carboxylate was treated with trifluoroacetic acid by method G.

10 This resulted in the product with the molecular weight of 330.48 (C₁₉H₃₀N₄O); MS (ESI): 331 (M+H⁺).

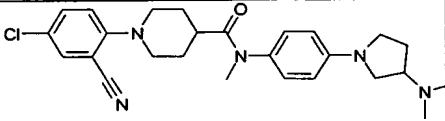
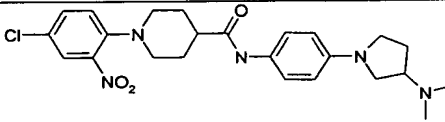
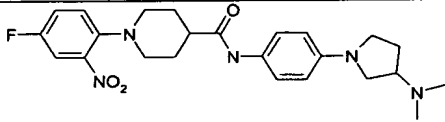
Piperidine-4-carboxylic acid [4-(3-dimethylamino-pyrrolidin-1-yl)phenyl]-amide can be prepared analogously.

tert-Butyl 4-[[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]methylcarbamoyl]-piperidine-1-carboxylate

15 A solution of N-Boc-piperidine-4-carboxylic acid (550 mg) and pyridine (0.47 ml) in dichloromethane (15 ml) was mixed with thionyl chloride (0.21 ml) and, after 30 minutes, a solution of dimethyl[1-(4-methylaminophenyl)pyrrolidin-3-yl]amine (0.5 g), triethylamine (1.17 ml),
20 DMAP (0.44 g) and dichloromethane (10 ml) was added dropwise. After 16 hours, the mixture was diluted with dichloromethane, washed with water and saturated brine, dried over sodium sulfate and concentrated. The residue was purified by chromatography (silica gel, eluent: ethyl acetate/ammonia (7N in methanol)). This resulted in the product with the
25 molecular weight of 430.60 (C₂₄H₃₈N₄O₃); MS (ESI): 431 (M+H⁺).

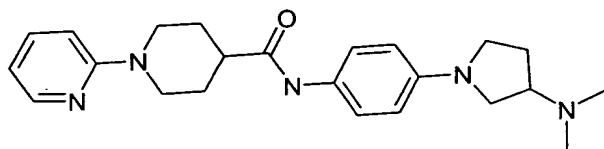
tert-Butyl 4-[[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]carbamoyl]piperidine-1-carboxylate can be prepared analogously.

30 The following examples were prepared analogously.

Ex. No.	Structure	Molecular formula	Molecular weight	M+H+
317		C ₂₅ H ₃₀ ClN ₅ O	466.03	466
318		C ₂₄ H ₃₀ ClN ₅ O ₃	471.99	472
319		C ₂₄ H ₃₀ FN ₅ O ₃	455.54	456

Example 320

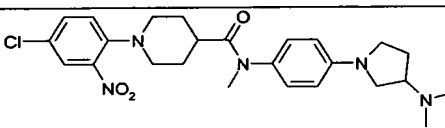
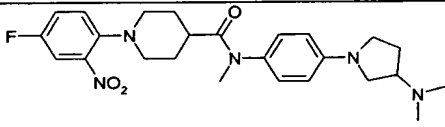
- 5 3,4,5,6-Tetrahydro-2H-[1,2']bipyridinyl-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide



- 10 Piperidine-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]-amide (30 mg) and 2-chloropyridine (90 mg) were heated at 160°C for 2 hours. 2-Chloropyridine (0.2 ml) was added and the mixture was again heated at 160°C for 4 hours. The cooled crude mixture was purified by chromatography (silica gel, eluent: ethyl acetate/ammonia (3N in methanol)). This resulted in the product with the molecular weight of 393.54(C₂₃H₃₁N₅O); MS (ESI): 394 (M+H+).

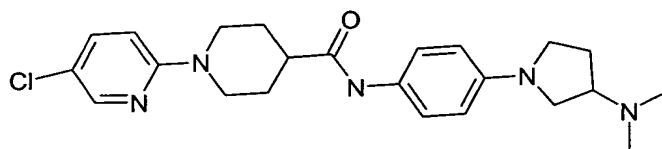
15

The following examples were prepared analogously.

Ex. No.	Structure	Molecular formula	Molecular weight	M+H+
321		C ₂₅ H ₃₂ ClN ₅ O ₃	486.02	486
322		C ₂₄ H ₃₀ FN ₅ O ₃	469.56	470

Example 323

- 5 5'-Chloro-3,4,5,6-tetrahydro-2H-[1,2']bipyridinyl-4-carboxylic acid [4-(3-dimethylamino- pyrrolidin-1-yl)phenyl]amid

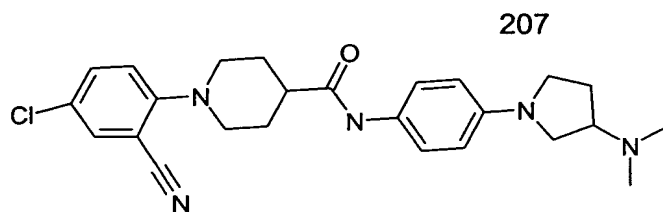


- Piperidine-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide (30 mg), 2,5-dichloropyridine (30 mg) and tributylamine (0.2 ml) were heated at 160°C for 2 hours. The cooled crude mixture was washed with heptane and purified by chromatography (silica gel, eluent: ethyl acetate/ammonia (3N in methanol)). This resulted in the product with the molecular weight of 427.98 (C₂₃H₃₀ClN₅O); MS (ESI): 428 (M+H+).

15

Example 324

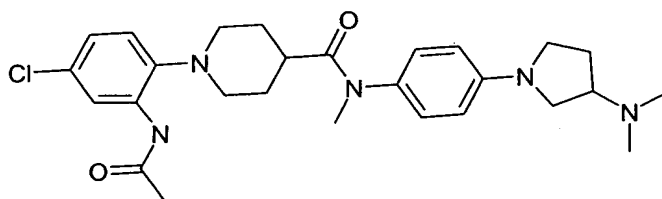
- 1-(4-Chloro-2-cyanophenyl)piperidine-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide



Piperidine-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide was reacted with 2,5-dichlorobenzonitrile as described in example 323. This resulted in the product with the molecular weight of 452.00 (C₂₅H₃₀ClN₅O); MS (ESI): 452 (M+H⁺).

Example 325

1-(2-Acetylamino-4-chlorophenyl)piperidine-4-carboxylic acid [4-(3-dimethylamino- pyrrolidin-1-yl)phenyl]methanamide



Palladium on carbon (10%; 10 mg) was added to a solution of 1-(4-chloro-2-nitro-phenyl)piperidine-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]methanamide (50 mg) in glacial acetic acid (5 ml). The solution was stirred under a hydrogen atmosphere (1 bar), and acetic anhydride (14 μ l) was added. After one hour, further acetic anhydride (6 μ l) were added and the mixture was stirred for 15 minutes. The suspension was filtered and the filtrate was concentrated. The residue was purified by chromatography (silica gel, eluent: ethyl acetate/ammonia (7N in methanol)). This resulted in the product with the molecular weight of 498.07 (C₂₇H₃₆ClN₅O₂); MS (ESI): 498 (M+H⁺).

The following examples were prepared analogously.

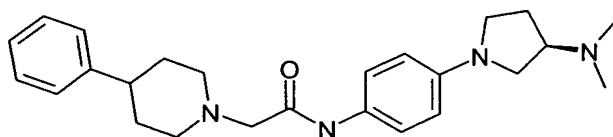
Ex. No.	Structure	Molecular formula	Molecular weight	M+H ⁺

326		C27H36FN5O2	481.62	482
327		C26H34ClN5O2	484.05	484
328		C26H34FN5O3	467.59	468

Example 329

(R)-N-[4-(3-Dimethylaminopyrrolidin-1-yl)phenyl]-2-(4-phenylpiperidin-1-yl)acetamide

5



Cesium carbonate (100 mg) and 4-phenylpiperidine (48 mg) were added to a solution of (R)-2-chloro-N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]acetamide (80 mg) in acetonitrile (5 ml) and DMF (1 ml), and the mixture was kept at 65°C for 12 hours. The mixture was freed of volatile fractions and the residue was partitioned between water and dichloromethane. The organic phase was dried over sodium sulfate, filtered and concentrated. The residue was purified by chromatography (silica gel, eluent: methanol/dichloromethane). This resulted in the product with the molecular weight of 406.58 (C25H34N4O); MS (ESI): 407 (M+H+).

15

It is alternatively possible to use potassium carbonate or pyridine as auxiliary bases, to add potassium iodide as catalyst, or to carry out the reaction at 150°C in a microwave apparatus.

(R)-2-Chloro-N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]acetamide

Triethylamine (2.03 g) was added to a solution of (R)- [1-(4-aminophenyl)pyrrolidin-3-yl]-dimethylamine (3.15 g) in dichloromethane (120 ml), and then chloroacetyl chloride (2.26 g) was added dropwise. After

- 5 3 hours, the mixture was diluted with dichloromethane and washed with water and brine. The organic phase was dried over sodium sulfate, filtered and concentrated. The residue was purified by chromatography (silica gel, eluent: methanol/dichloromethane). This resulted in the product with the molecular weight of 281.79 (C₁₄H₂₀ClN₃O); MS (ESI): 282 (M+H⁺).

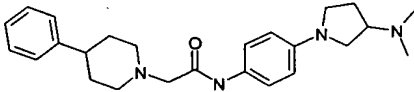
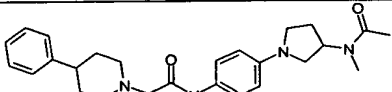
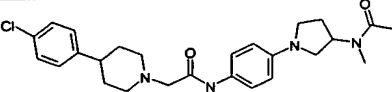
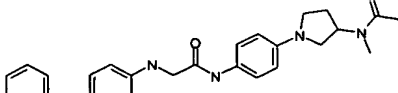
- 10 The following were obtained analogously:

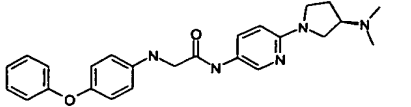
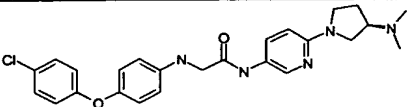
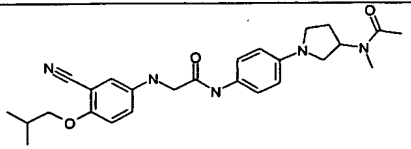
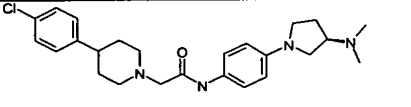
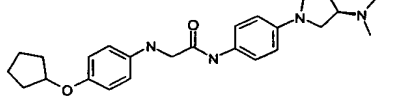
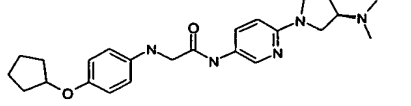
N-{4-[3-(Acetylmethylamino)pyrrolidin-1-yl]phenyl}-2-chloroacetamide

2-Chloro-N-[4-(3-dimethylaminopyrrolidin-1-yl)phenyl]acetamide

(R)-2-Chloro-N-[6-(3-dimethylaminopyrrolidin-1-yl)pyridin-3-yl]acetamide

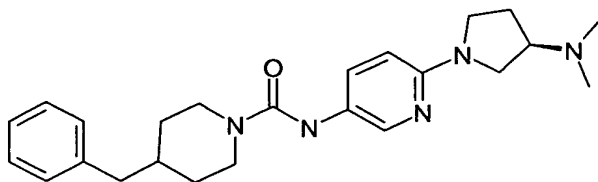
- 15 The following examples were prepared in analogy to the method given in example 329:

Ex. No.	Structure	Molecular formula	Molecular weight	M+H ⁺
330		C ₂₅ H ₃₄ N ₄ O	406.58	407
331		C ₂₆ H ₃₄ N ₄ O ₂	434.59	435
332		C ₂₆ H ₃₃ ClN ₄ O ₂	469.03	469
333		C ₂₇ H ₃₀ N ₄ O ₃	458.57	459

334		C ₂₅ H ₂₉ N ₅ O ₂	431.54	432
335		C ₂₅ H ₂₈ ClN ₅ O ₂	465.99	466
336		C ₂₆ H ₃₃ N ₅ O ₃	463.59	464
337		C ₂₅ H ₃₃ ClN ₄ O	441.02	441
338		C ₂₅ H ₃₄ N ₄ O ₂	422.58	423
339		C ₂₄ H ₃₃ N ₅ O ₂	423.56	424

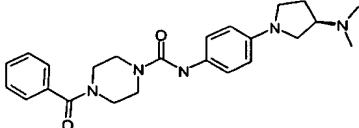
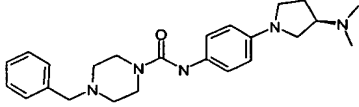
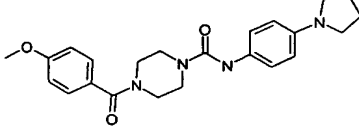
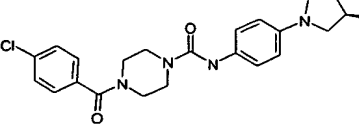
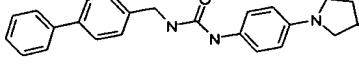
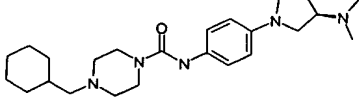
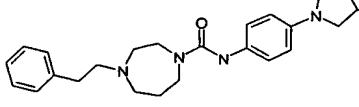
Example 340

(R)-4-Benzylpiperidine-1-carboxylic acid [6-(3-dimethylaminopyrrolidin-1-yl)pyridin-3-yl]-amide



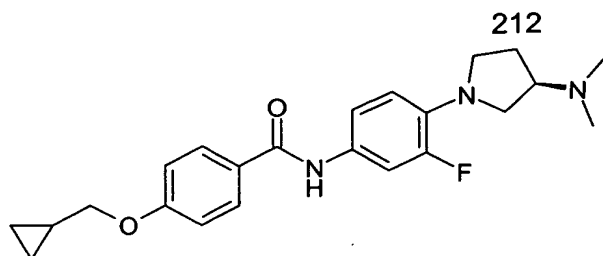
(R)-6-(3-Dimethylaminopyrrolidin-1-yl)pyridin-3-ylamine was added to a solution of carbonyldiimidazole (53 mg) in DMF (0.5 ml) at 0°C. After 15 minutes, 4-benzylpiperidine (57 mg) was added and the mixture was heated at 90°C for one hour. The cooled mixture was freed of volatile fractions. The residue was purified by chromatography (silica gel, eluent: methanol/dichloromethane). This resulted in the product with the molecular weight of 407.56 (C₂₄H₃₃N₅O); MS (ESI): 408 (M+H⁺).

The following examples were prepared analogously:

Ex. No.	Structure	Molecular formula	Molecular weight	M+H ⁺
341		C ₂₄ H ₃₁ N ₅ O ₂	421.55	422
342		C ₂₄ H ₃₃ N ₅ O	407.56	408
343		C ₂₆ H ₃₄ N ₄ O ₃	450.59	451
344		C ₂₅ H ₃₁ ClN ₄ O ₂	455.00	455
345		C ₂₆ H ₃₀ N ₄ O	414.56	415
346		C ₂₄ H ₃₉ N ₅ O	413.61	414
347		C ₂₆ H ₃₇ N ₅ O	435.62	436

5 Example 348

(R)-4-Cyclopropylmethoxy-N-[4-(3-dimethylaminopyrrolidin-1-yl)-3-fluorophenyl]- benzamide



(R)-4-Benzyloxy-N-[4-(3-dimethylaminopyrrolidin-1-yl)-3-fluorophenyl]benzamide underwent debenzylating hydrogenation by method B. The resulting (R)-N-[4-(3-dimethylaminopyrrolidin-1-yl)-3-fluorophenyl]-4-hydroxybenzamide was alkylated with cyclopropylmethyl bromide by method H. This resulted in the product with the molecular weight of 397.50 (C₂₃H₂₈N₃O₂); MS (ESI): 398 (M+H⁺).

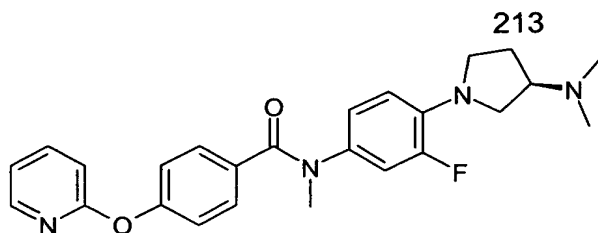
The following examples were likewise obtained by method H:

Ex. No.	Structure	Molecular formula	Molecular weight	M+H ⁺
349		C ₂₆ H ₃₄ FN ₃ O ₂	439.58	440
350		C ₂₅ H ₃₂ FN ₃ O ₃	441.55	442
351		C ₂₄ H ₃₀ FN ₃ O ₂	411.52	412

10

Example 352

(R)-N-[4-(3-Dimethylaminopyrrolidin-1-yl)-3-fluorophenyl]-4-(pyridin-2-yloxy)benzamide



(R)-N-[4-(3-Dimethylaminopyrrolidin-1-yl)-3-fluorophenyl]-4-hydroxybenzamide was reacted with 2-chloropyridine by method R. This resulted in the product with the molecular weight of 434.52 (C₂₅H₂₇N₄O₂);
 5 MS (ESI): 435 (M+H⁺).

Example 353 – example 507

Various pyrrolidinylanilines were reacted with diverse amines by method A.
 10 The resulting products are summarized in table 6.

Example 508 – example 1130

Various pyrrolidinylanilines were reacted with diverse acids by methods E.
 The resulting products are summarized in table 7.

15

Example 1131 – example 1232

Various (hetero)aryl halides were reacted with diverse boronic acids by methods O. The resulting products are summarized in table 8.

20 Example 1233 – example 1237

Various aryl halides were reacted with diverse acetylenes by methods J.
 The resulting products are summarized in table 9.

Example 1238 – example 1403

25 Various aminopyrrolidines and N-arylpiperidinones were reacted with diverse aldehydes, ketones and amines by method N. The resulting products are summarized in table 10.

Example 1404 – example 1423

30 Various aminopyrrolidines were reductively methylated with formaldehyde by method E. The resulting products are summarized in table 11.

Example 1424 – example 1443

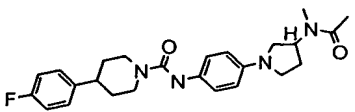
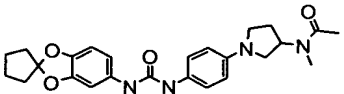
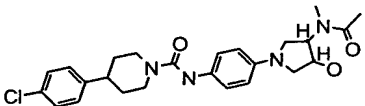
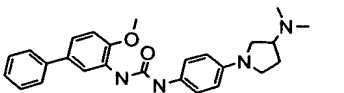
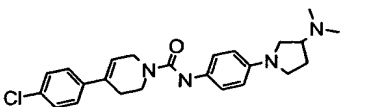
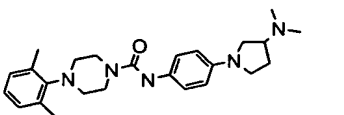
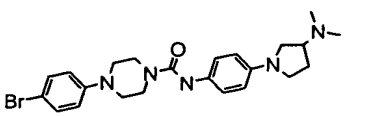
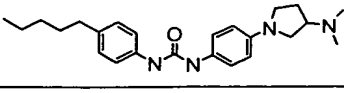
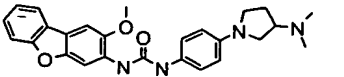
Various amides were alkylated by method F. The resulting products are summarized in table 12.

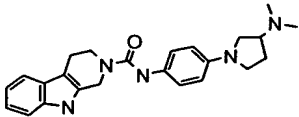
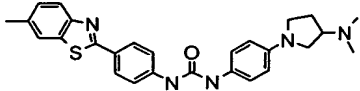
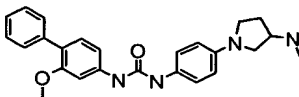
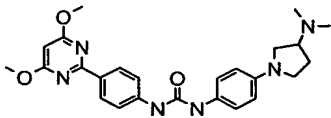
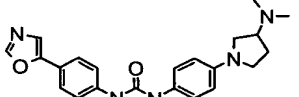
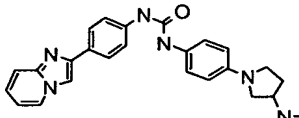
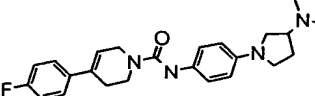
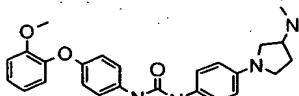
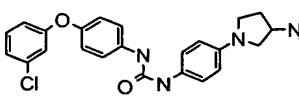
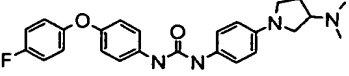
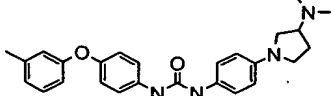
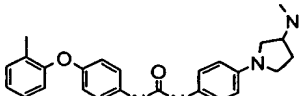
5 Example 1444 – example 1618

Various tert-butyl carbamates were cleaved by method G. The resulting products were summarized in table 13.

Table 6

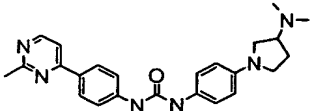
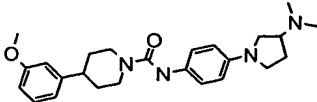
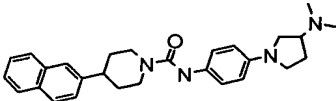
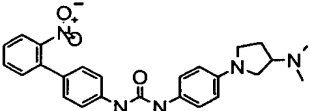
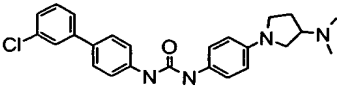
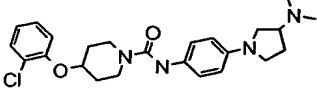
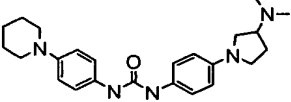
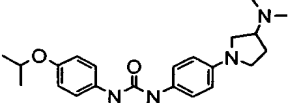
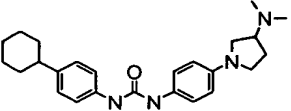
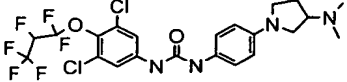
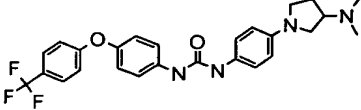
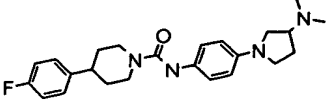
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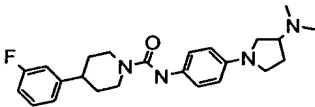
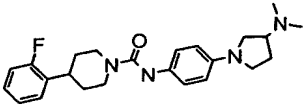
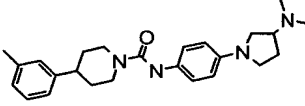
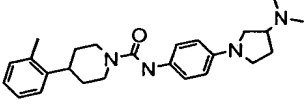
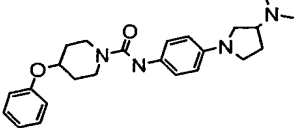
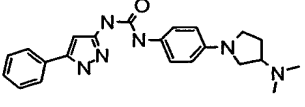
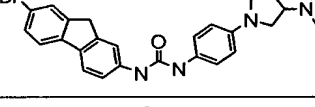
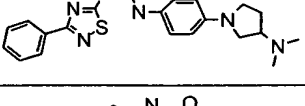
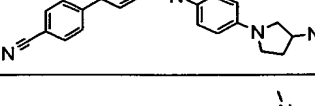
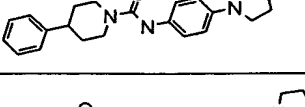
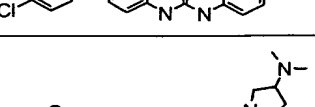
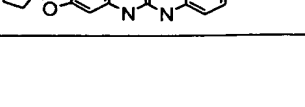
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
353		C ₂₅ H ₃₁ FN ₄ O ₂	438.24	439
354		C ₂₅ H ₃₀ N ₄ O ₄	450.23	451
355		C ₂₅ H ₃₁ ClN ₄ O ₃	470.21	471
356		C ₂₆ H ₃₀ N ₄ O ₂	430.24	431
357		C ₂₄ H ₂₉ ClN ₄ O	424.20	425
358		C ₂₅ H ₃₅ N ₅ O	421.28	422
359		C ₂₃ H ₃₀ BrN ₅ O	471.16	472
360		C ₂₄ H ₃₄ N ₄ O	394.27	395
361		C ₂₆ H ₂₈ N ₄ O ₃	444.22	445

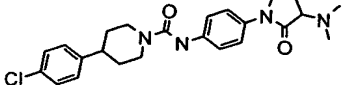
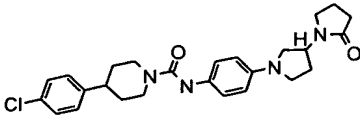
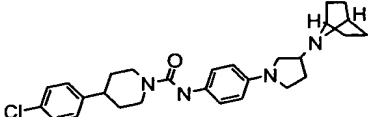
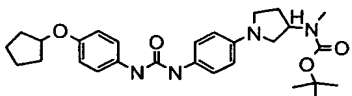
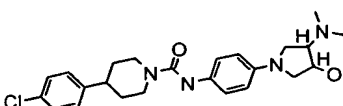
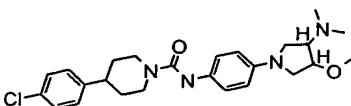
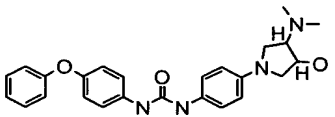
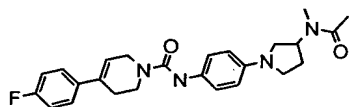
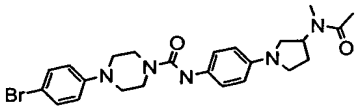
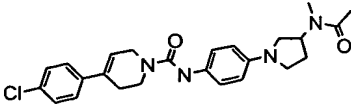
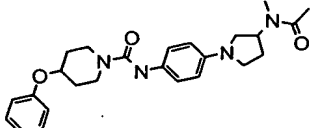
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
362		C ₂₄ H ₂₉ N ₅ O	403.24	404
363		C ₂₇ H ₂₉ N ₅ OS	471.21	472
364		C ₂₆ H ₃₀ N ₄ O ₂	430.24	431
365		C ₂₅ H ₃₀ N ₆ O ₃	462.24	463
366		C ₂₂ H ₂₅ N ₅ O ₂	391.20	392
367		C ₂₆ H ₂₈ N ₆ O	440.23	441
368		C ₂₄ H ₂₉ FN ₄ O	408.23	409
369		C ₂₆ H ₃₀ N ₄ O ₃	446.23	447
370		C ₂₅ H ₂₇ ClN ₄ O ₂	450.18	451
371		C ₂₅ H ₂₇ FN ₄ O ₂	434.21	435
372		C ₂₆ H ₃₀ N ₄ O ₂	430.24	431
373		C ₂₆ H ₃₀ N ₄ O ₂	430.24	431

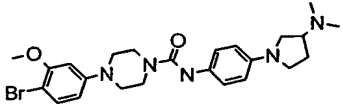
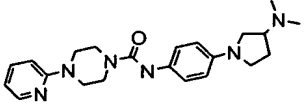
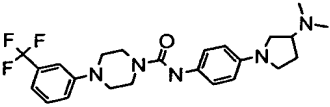
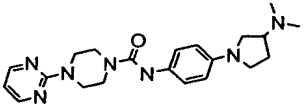
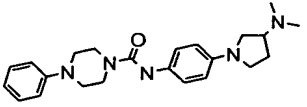
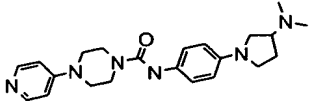
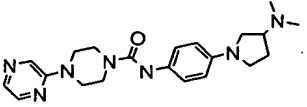
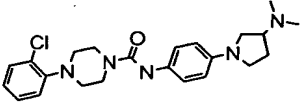
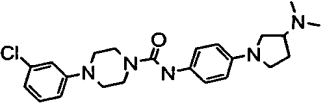
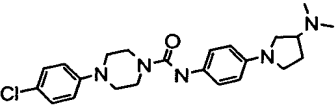
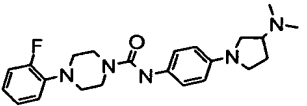
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
374		C ₂₆ H ₃₀ N ₄ O ₃	446.23	447
375		C ₂₅ H ₂₇ ClN ₄ O ₂	450.18	451
376		C ₂₃ H ₃₂ N ₄ O ₂	396.25	397
377		C ₂₅ H ₂₉ N ₅ O ₂	431.23	432
378		C ₂₄ H ₂₇ N ₅ O ₂	417.22	418
379		C ₂₅ H ₃₅ N ₅ O ₂	437.28	438
380		C ₂₅ H ₂₇ FN ₄ O ₂	434.21	435
381		C ₂₆ H ₂₇ F ₃ N ₄ O ₂	484.21	485
382		C ₂₆ H ₂₇ F ₃ N ₄ O	468.21	469
383		C ₂₄ H ₃₁ ClN ₄ O ₂	442.21	443
384		C ₂₅ H ₂₈ N ₄ O	400.23	401
385		C ₂₆ H ₃₀ N ₄ O ₂	430.24	431

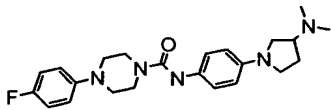
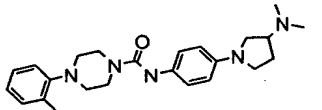
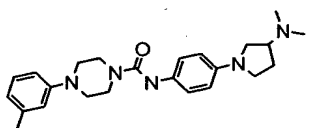
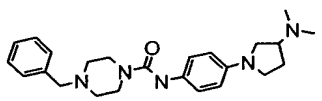
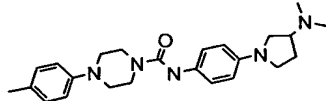
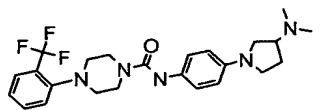
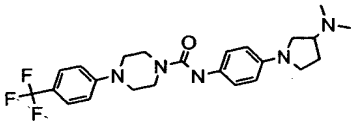
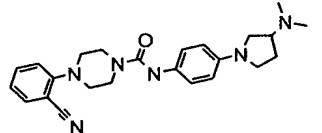
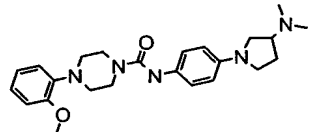
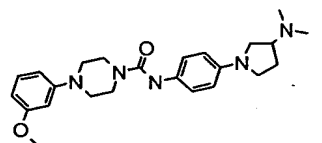
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
386		C ₂₃ H ₃₂ N ₄ O ₂	396.25	397
387		C ₂₅ H ₃₄ N ₄ O ₂	422.27	423
388		C ₂₄ H ₃₁ ClN ₄ O	426.22	427
389		C ₂₅ H ₃₄ N ₄ O	406.27	407
390		C ₂₅ H ₃₁ F ₃ N ₄ O	460.24	461
391		C ₂₅ H ₃₁ F ₃ N ₄ O ₂	476.24	477
392		C ₂₃ H ₃₁ N ₅ O ₄	441.24	442
393		C ₂₄ H ₃₀ N ₄ O ₃	422.23	423
394		C ₂₄ H ₃₂ ClN ₅ O	441.23	442
395		C ₂₅ H ₂₇ ClN ₄ O	434.19	435
396		C ₂₅ H ₂₈ N ₄ O	400.23	401

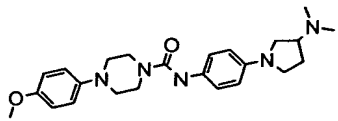
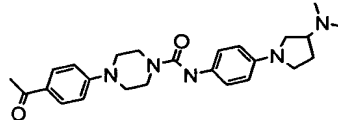
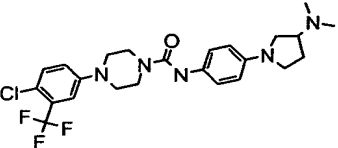
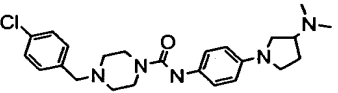
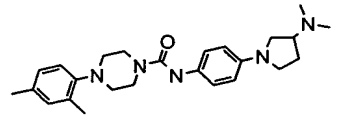
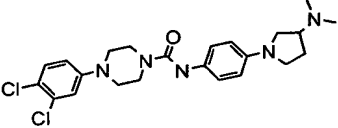
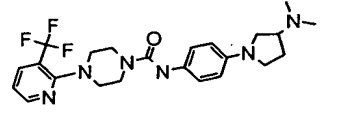
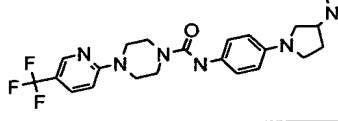
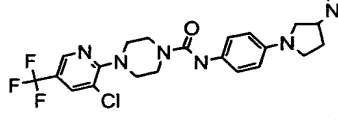
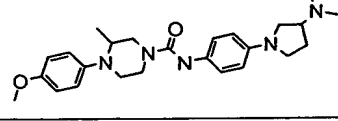
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
397		C ₂₄ H ₂₈ N ₆ O	416.23	417
398		C ₂₅ H ₃₄ N ₄ O ₂	422.27	423
399		C ₂₈ H ₃₄ N ₄ O	442.27	443
400		C ₂₅ H ₂₇ N ₅ O ₃	445.21	446
401		C ₂₅ H ₂₇ ClN ₄ O	434.19	435
402		C ₂₄ H ₃₁ ClN ₄ O ₂	442.21	443
403		C ₂₄ H ₃₃ N ₅ O	407.27	408
404		C ₂₂ H ₃₀ N ₄ O ₂	382.24	383
405		C ₂₅ H ₃₄ N ₄ O	406.27	407
406		C ₂₂ H ₂₂ Cl ₂ F ₆ N ₄ O ₂	558.10	559
407		C ₂₆ H ₂₇ F ₃ N ₄ O ₂	484.21	485
408		C ₂₄ H ₃₁ FN ₄ O	410.25	411

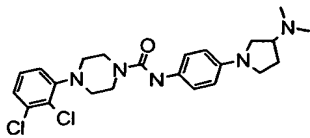
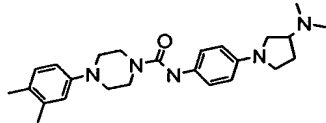
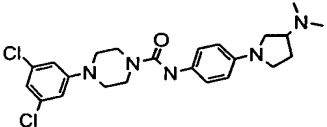
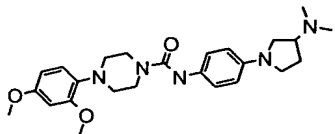
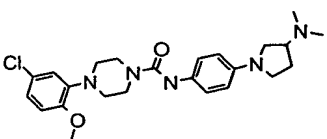
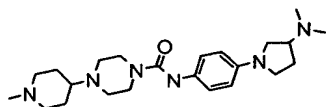
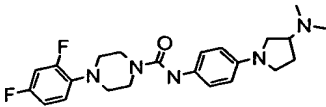
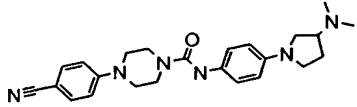
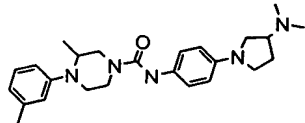
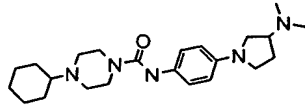
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
409		C ₂₄ H ₃₁ FN ₄ O	410.25	411
410		C ₂₄ H ₃₁ FN ₄ O	410.25	411
411		C ₂₅ H ₃₄ N ₄ O	406.27	407
412		C ₂₅ H ₃₄ N ₄ O	406.27	407
413		C ₂₄ H ₃₂ N ₄ O ₂	408.25	409
414		C ₂₂ H ₂₆ N ₆ O	390.22	391
415		C ₂₆ H ₂₇ BrN ₄ O	490.14	491
416		C ₂₁ H ₂₄ N ₆ OS	408.17	409
417		C ₂₆ H ₂₇ N ₅ O	425.22	426
418		C ₂₄ H ₃₂ N ₄ O	392.26	393
419		C ₂₅ H ₂₇ ClN ₄ O ₂	450.18	451
420		C ₂₄ H ₃₀ N ₄ O ₃	422.23	423

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
421		C ₂₄ H ₂₉ ClN ₄ O ₂	440.20	441
422		C ₂₆ H ₃₁ ClN ₄ O ₂	466.21	467
423		C ₂₈ H ₃₅ ClN ₄ O	478.25	479
424		C ₂₈ H ₃₈ N ₄ O ₄	494.29	495
425		C ₂₄ H ₃₁ ClN ₄ O ₂	442.21	443
426		C ₂₅ H ₃₃ ClN ₄ O ₂	456.23	457
427		C ₂₅ H ₂₈ N ₄ O ₃	432.22	433
428		C ₂₅ H ₂₉ FN ₄ O ₂	436.23	437
429		C ₂₄ H ₃₀ BrN ₅ O ₂	499.16	500
430		C ₂₅ H ₂₉ ClN ₄ O ₂	452.20	453
431		C ₂₅ H ₃₂ N ₄ O ₃	436.25	437

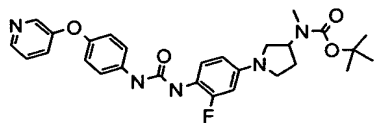
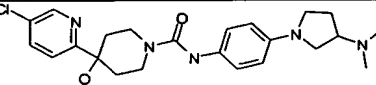
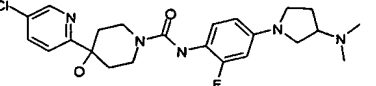
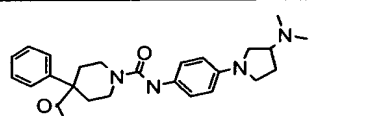
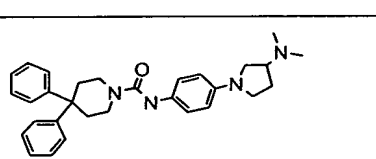
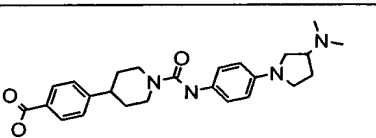
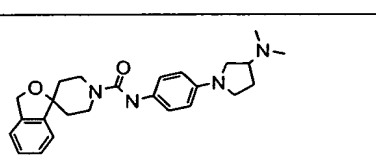
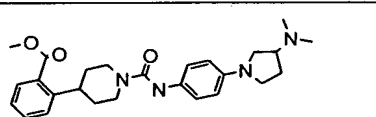
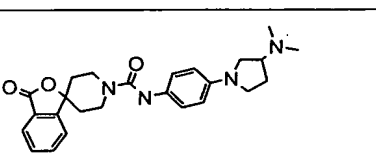
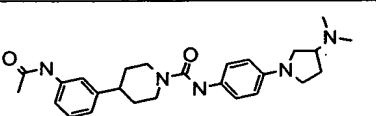
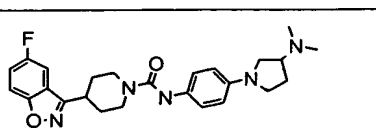
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
432		C ₂₄ H ₃₂ BrN ₅ O ₂	501.17	502
433		C ₂₂ H ₃₀ N ₆ O	394.25	395
434		C ₂₄ H ₃₀ F ₃ N ₅ O	461.24	462
435		C ₂₁ H ₂₉ N ₇ O	395.24	396
436		C ₂₃ H ₃₁ N ₅ O	393.25	394
437		C ₂₂ H ₃₀ N ₆ O	394.25	395
438		C ₂₁ H ₂₉ N ₇ O	395.24	396
439		C ₂₃ H ₃₀ ClN ₅ O	427.21	428
440		C ₂₃ H ₃₀ ClN ₅ O	427.21	428
441		C ₂₃ H ₃₀ ClN ₅ O	427.21	428
442		C ₂₃ H ₃₀ FN ₅ O	411.24	412

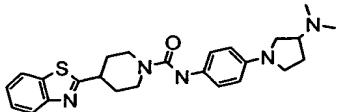
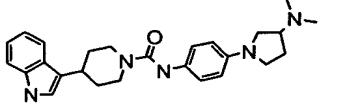
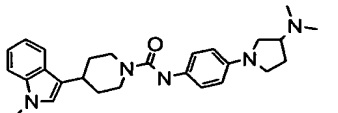
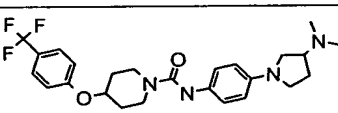
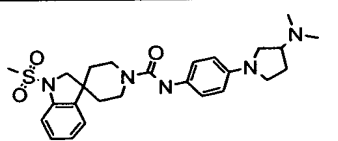
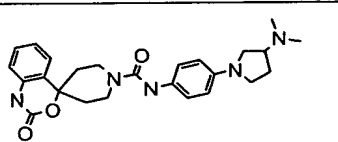
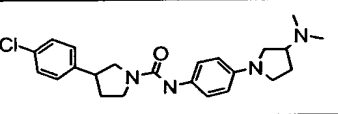
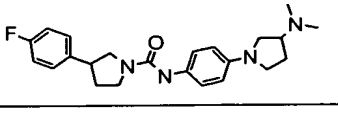
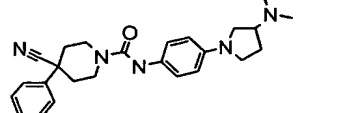
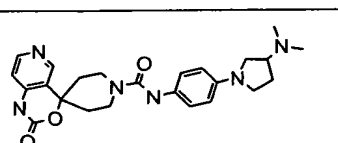
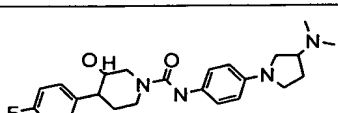
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
443		C ₂₃ H ₃₀ FN ₅ O	411.24	412
444		C ₂₄ H ₃₃ N ₅ O	407.27	408
445		C ₂₄ H ₃₃ N ₅ O	407.27	408
446		C ₂₄ H ₃₃ N ₅ O	407.27	408
447		C ₂₄ H ₃₃ N ₅ O	407.27	408
448		C ₂₄ H ₃₀ F ₃ N ₅ O	461.24	462
449		C ₂₄ H ₃₀ F ₃ N ₅ O	461.24	462
450		C ₂₄ H ₃₀ N ₆ O	418.25	419
451		C ₂₄ H ₃₃ N ₅ O ₂	423.26	424
452		C ₂₄ H ₃₃ N ₅ O ₂	423.26	424

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
453		C ₂₄ H ₃₃ N ₅ O ₂	423.26	424
454		C ₂₅ H ₃₃ N ₅ O ₂	435.26	436
455		C ₂₄ H ₂₉ ClF ₃ N ₅ O	495.20	496
456		C ₂₄ H ₃₂ ClN ₅ O	441.23	442
457		C ₂₅ H ₃₅ N ₅ O	421.28	422
458		C ₂₃ H ₂₉ Cl ₂ N ₅ O	461.17	462
459		C ₂₃ H ₂₉ F ₃ N ₆ O	462.24	463
460		C ₂₃ H ₂₉ F ₃ N ₆ O	462.24	463
461		C ₂₃ H ₂₈ ClF ₃ N ₆ O	496.20	497
462		C ₂₅ H ₃₅ N ₅ O ₂	437.28	438

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
463		C ₂₃ H ₂₉ Cl ₂ N ₅ O	461.17	462
464		C ₂₅ H ₃₅ N ₅ O	421.28	422
465		C ₂₃ H ₂₉ Cl ₂ N ₅ O	461.17	462
466		C ₂₅ H ₃₅ N ₅ O ₃	453.27	454
467		C ₂₄ H ₃₂ ClN ₅ O ₂	457.22	458
468		C ₂₃ H ₃₈ N ₆ O	414.31	415
469		C ₂₃ H ₂₉ F ₂ N ₅ O	429.23	430
470		C ₂₄ H ₃₀ N ₆ O	418.25	419
471		C ₂₅ H ₃₅ N ₅ O	421.28	422
472		C ₂₃ H ₃₇ N ₅ O	399.30	400

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
473		C ₂₃ H ₃₂ N ₆ O	408.26	409
474		C ₂₃ H ₃₂ N ₆ O	408.26	409
475		C ₂₆ H ₃₇ N ₅ O	435.30	436
476		C ₂₈ H ₃₆ ClN ₅ O ₂	509.26	510
477		C ₂₅ H ₃₄ N ₄ O	406.27	407
478		C ₂₅ H ₃₁ FN ₄ O ₂	438.24	439
479		C ₂₃ H ₂₇ ClFN ₅ O	443.96	444
480		C ₂₃ H ₃₀ FN ₅ O ₂	427.53	428
481		C ₂₃ H ₂₉ F ₂ N ₅ O ₂	445.52	446
482		C ₂₃ H ₂₇ F ₂ N ₅ O	427.50	428
483		C ₂₃ H ₂₉ ClFN ₅ O ₂	461.97	462
484		C ₂₈ H ₃₇ FN ₄ O ₄	512.28	513

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
485		C ₂₈ H ₃₂ FN ₅ O ₄	521.24	522
486		C ₂₃ H ₃₀ ClN ₅ O ₂	443.98	444
487		C ₂₃ H ₂₉ ClFN ₅ O ₂	461.97	462
488		C ₂₆ H ₃₄ N ₄ O ₂	434.27	435
489		C ₃₀ H ₃₆ N ₄ O	468.29	469
490		C ₂₆ H ₃₄ N ₄ O ₃	450.26	451
491		C ₂₅ H ₃₂ N ₄ O ₂	420.25	421
492		C ₂₆ H ₃₄ N ₄ O ₃	450.26	451
493		C ₂₅ H ₃₀ N ₄ O ₃	434.23	435
494		C ₂₆ H ₃₅ N ₅ O ₂	449.28	450
495		C ₂₅ H ₃₀ FN ₅ O ₂	451.24	452

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
496		C ₂₅ H ₃₁ N ₅ O ₂ S	449.23	450
497		C ₂₆ H ₃₃ N ₅ O	431.27	432
498		C ₂₇ H ₃₅ N ₅ O	445.28	446
499		C ₂₅ H ₃₁ F ₃ N ₄ O ₂	476.24	477
500		C ₂₆ H ₃₅ N ₅ O ₃ S	497.25	498
501		C ₂₅ H ₃₁ N ₅ O ₃	449.24	450
502		C ₂₃ H ₂₉ ClN ₄ O	412.20	413
503		C ₂₃ H ₂₉ FN ₄ O	396.23	397
504		C ₂₅ H ₃₁ N ₅ O	417.25	418
505		C ₂₄ H ₃₀ N ₆ O ₃	450.24	451
506		C ₂₄ H ₃₁ FN ₄ O ₂	426.24	427

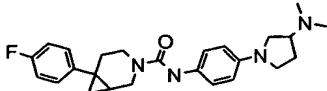
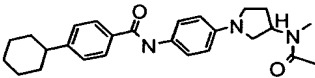
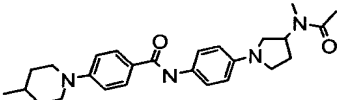
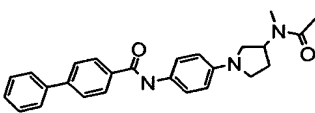
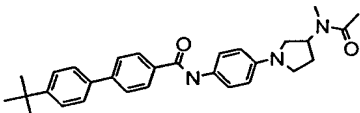
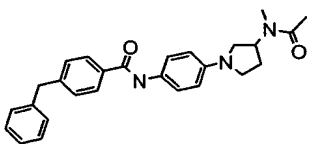
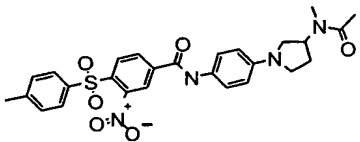
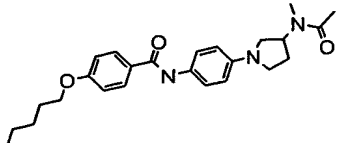
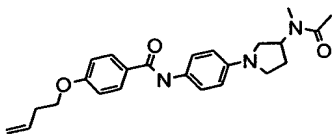
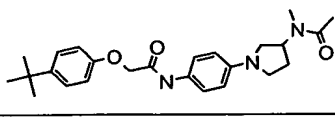
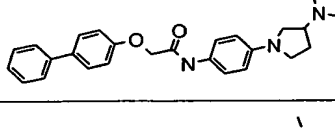
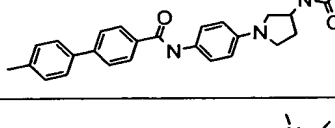
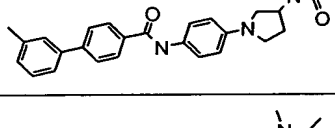
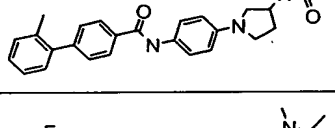
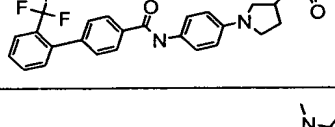
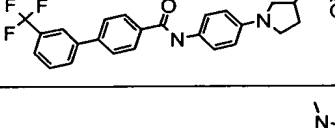
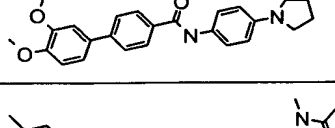
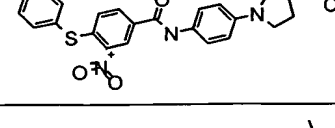
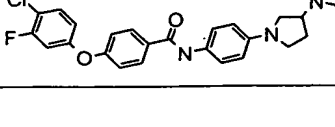
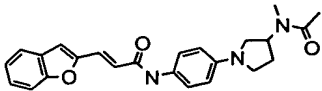
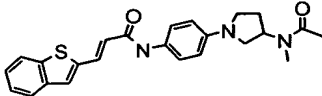
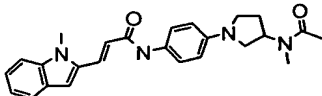
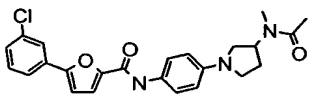
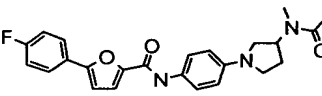
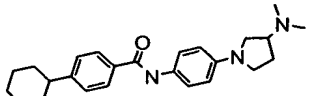
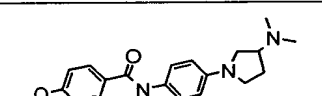
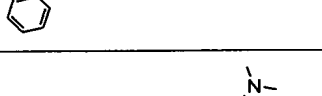
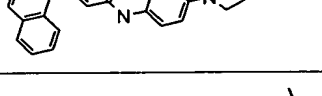
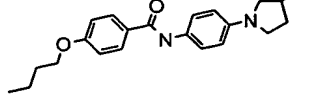
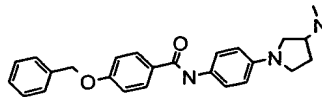
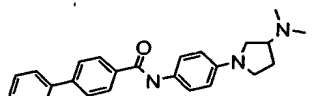
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
507		C ₂₅ H ₃₁ FN ₄ O	422.25	423

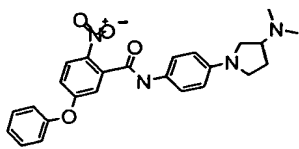
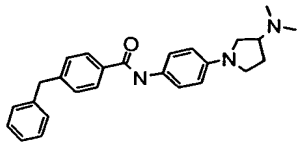
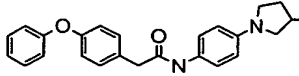
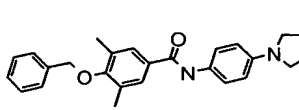
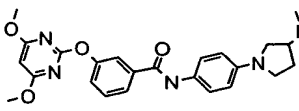
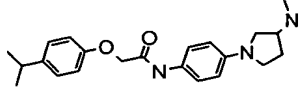
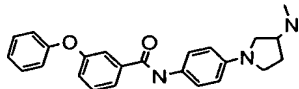
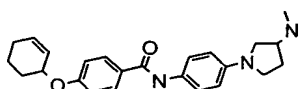
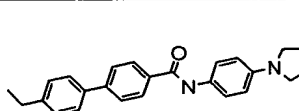
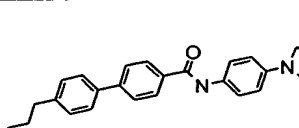
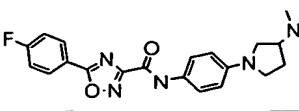
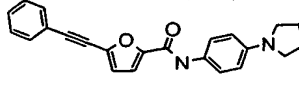
Table 7

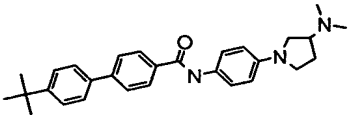
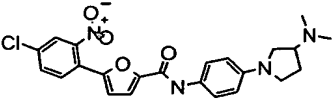
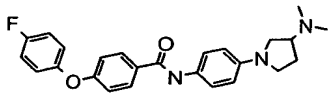
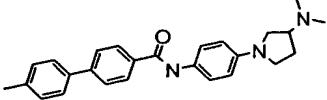
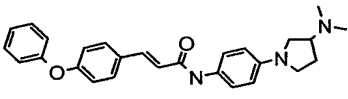
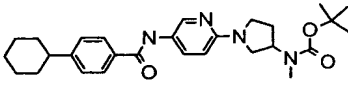
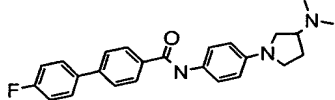
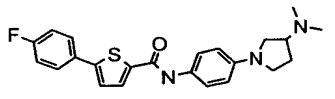
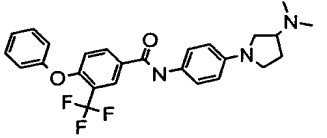
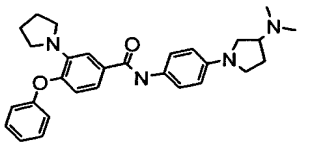
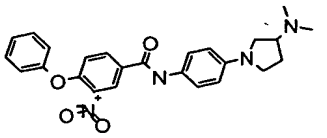
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Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
508		C ₂₆ H ₃₃ N ₃ O ₂	419.26	420
509		C ₂₆ H ₃₄ N ₄ O ₂	434.27	435
510		C ₂₆ H ₂₇ N ₃ O ₂	413.21	414
511		C ₃₀ H ₃₅ N ₃ O ₂	469.27	470
512		C ₂₇ H ₂₉ N ₃ O ₂	427.23	428
513		C ₂₇ H ₂₈ N ₄ O ₆ S	536.17	537
514		C ₂₅ H ₃₃ N ₃ O ₃	423.25	424

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
515		C ₂₄ H ₂₉ N ₃ O ₃	407.22	408
516		C ₂₅ H ₃₃ N ₃ O ₃	423.25	424
517		C ₂₇ H ₂₉ N ₃ O ₃	443.22	444
518		C ₂₇ H ₂₉ N ₃ O ₂	427.23	428
519		C ₂₇ H ₂₉ N ₃ O ₂	427.23	428
520		C ₂₇ H ₂₉ N ₃ O ₂	427.23	428
521		C ₂₇ H ₂₆ F ₃ N ₃ O ₂	481.20	482
522		C ₂₇ H ₂₆ F ₃ N ₃ O ₂	481.20	482
523		C ₂₈ H ₃₁ N ₃ O ₄	473.23	474
524		C ₂₇ H ₂₈ N ₄ O ₄ S	504.18	505
525		C ₂₆ H ₂₅ ClF ₃ N ₃ O ₃	481.16	482

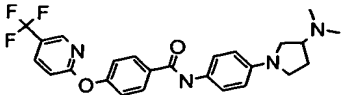
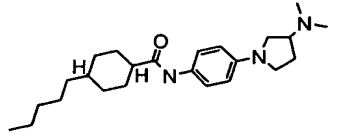
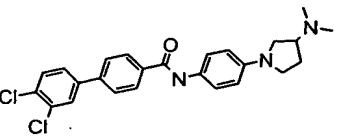
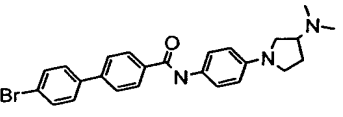
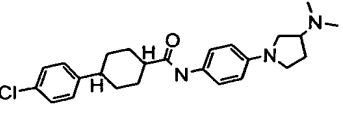
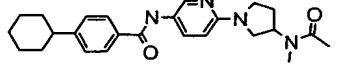
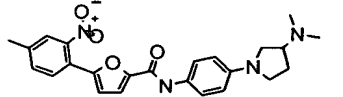
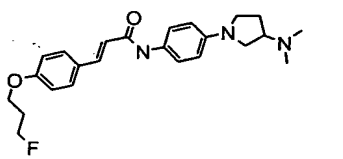
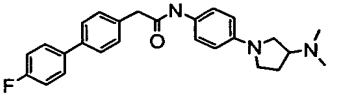
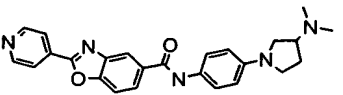
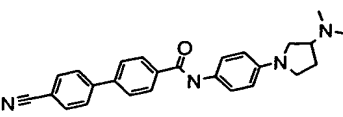
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
526		C ₂₄ H ₂₅ N ₃ O ₃	403.19	404
527		C ₂₄ H ₂₅ N ₃ O ₂ S	419.17	420
528		C ₂₅ H ₂₈ N ₄ O ₂	416.22	417
529		C ₂₄ H ₂₄ ClN ₃ O ₃	437.15	438
530		C ₂₄ H ₂₄ FN ₃ O ₃	421.18	422
531		C ₂₅ H ₃₃ N ₃ O	391.26	392
532		C ₂₅ H ₂₇ N ₃ O ₂	401.21	402
533		C ₂₅ H ₂₇ N ₃ O	385.21	386
534		C ₂₃ H ₃₁ N ₃ O ₂	381.24	382
535		C ₂₆ H ₂₉ N ₃ O ₂	415.23	416
536		C ₂₅ H ₂₇ N ₃ O	385.21	386
537		C ₂₄ H ₃₁ N ₃ O	377.25	378

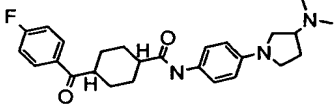
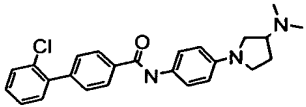
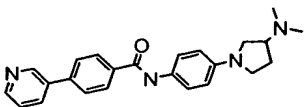
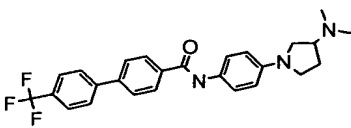
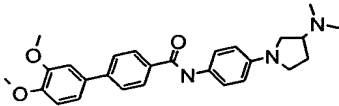
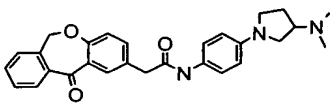
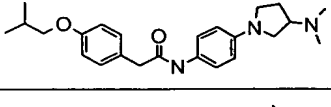
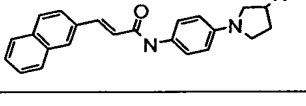
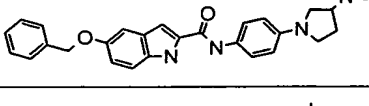
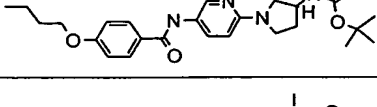
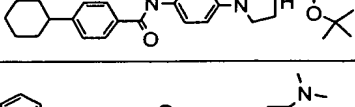
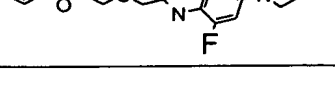
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
538		C ₂₅ H ₂₆ N ₄ O ₄	446.20	447
539		C ₂₆ H ₂₉ N ₃ O	399.23	400
540		C ₂₆ H ₂₉ N ₃ O ₂	415.23	416
541		C ₂₈ H ₃₃ N ₃ O ₂	443.26	444
542		C ₂₅ H ₂₉ N ₅ O ₄	463.22	464
543		C ₂₃ H ₃₁ N ₃ O ₂	381.24	382
544		C ₂₅ H ₂₇ N ₃ O ₂	401.21	402
545		C ₂₅ H ₃₁ N ₃ O ₂	405.24	406
546		C ₂₇ H ₃₁ N ₃ O	413.25	414
547		C ₂₈ H ₃₃ N ₃ O	427.26	428
548		C ₂₁ H ₂₂ FN ₅ O ₂	395.18	396
549		C ₂₅ H ₂₅ N ₃ O ₂	399.20	400

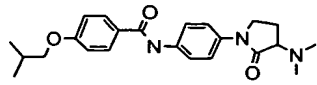
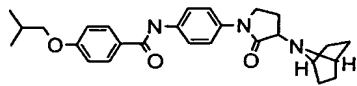
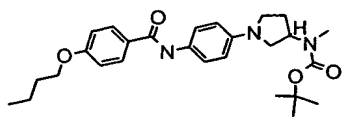
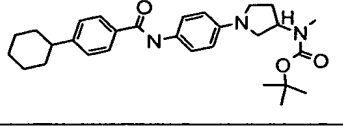
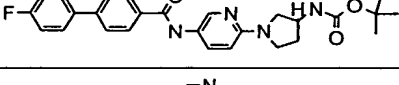
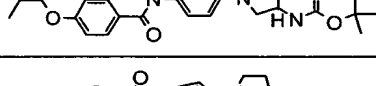
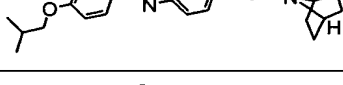
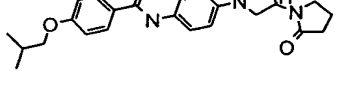
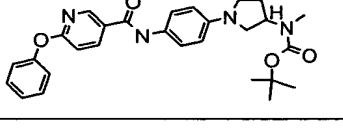
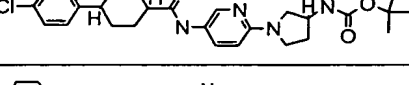
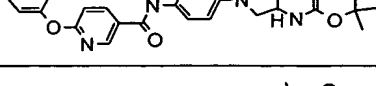
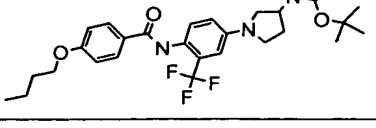
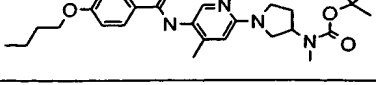
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
550		C ₂₉ H ₃₅ N ₃ O	441.28	442
551		C ₂₃ H ₂₃ ClN ₄ O ₄	454.14	455
552		C ₂₅ H ₂₆ FN ₃ O ₂	419.20	420
553		C ₂₆ H ₂₉ N ₃ O	399.23	400
554		C ₂₇ H ₂₉ N ₃ O ₂	427.23	428
555		C ₂₈ H ₃₈ N ₄ O ₃	478.29	479
556		C ₂₅ H ₂₆ FN ₃ O	403.21	404
557		C ₂₃ H ₂₄ FN ₃ OS	409.16	410
558		C ₂₆ H ₂₆ F ₃ N ₃ O ₂	469.20	470
559		C ₂₉ H ₃₄ N ₄ O ₂	470.27	471
560		C ₂₅ H ₂₆ N ₄ O ₄	446.20	447

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
561		C ₂₄ H ₃₃ N ₃ O ₂	395.26	396
562		C ₂₄ H ₃₃ N ₃ O ₂	395.26	396
563		C ₂₅ H ₂₆ FN ₃ O	403.21	404
564		C ₂₆ H ₂₉ N ₃ O ₂	415.23	416
565		C ₂₅ H ₂₆ ClN ₃ O	419.18	420
566		C ₂₆ H ₂₉ N ₃ O ₂	415.23	416
567		C ₂₆ H ₂₉ N ₃ O ₂	415.23	416
568		C ₂₅ H ₂₆ FN ₃ O	403.21	404
569		C ₂₆ H ₂₇ N ₃ O ₃	429.20	430
570		C ₂₆ H ₂₉ N ₃ O	399.23	400
571		C ₂₆ H ₂₉ N ₃ O	399.23	400

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
572		C ₂₆ H ₂₆ F ₃ N ₃ O	453.20	454
573		C ₂₆ H ₂₆ F ₃ N ₃ O	453.20	454
574		C ₂₆ H ₃₅ N ₃ O ₂	421.27	422
575		C ₂₇ H ₃₁ N ₃ O ₂	429.24	430
576		C ₂₅ H ₂₆ ClN ₃ O	419.18	420
577		C ₂₅ H ₂₅ Cl ₂ N ₃ O	453.14	454
578		C ₂₄ H ₂₈ N ₄ O ₂	404.22	405
579		C ₂₇ H ₃₁ N ₃ O ₃ S	477.21	478
580		C ₂₅ H ₃₁ N ₅ O ₃	449.24	450
581		C ₂₄ H ₃₁ N ₃ O ₂	393.24	394
582		C ₂₃ H ₃₁ N ₃ O ₂	381.24	382

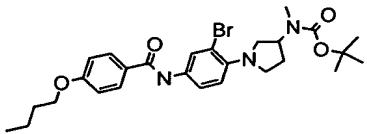
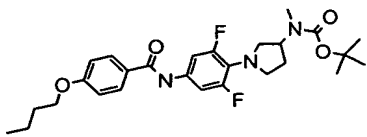
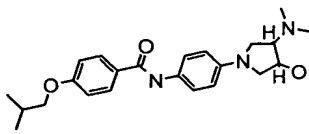
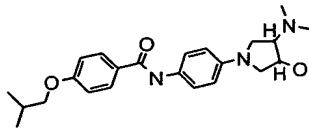
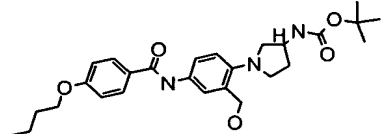
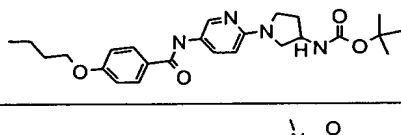
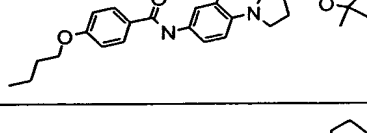
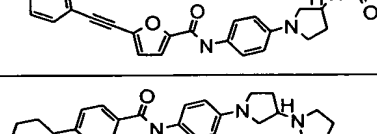
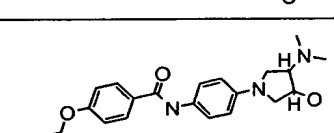
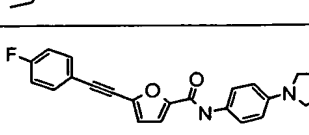
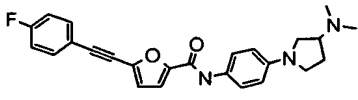
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
583		C ₂₅ H ₂₅ F ₃ N ₄ O ₂	470.19	471
584		C ₂₄ H ₃₉ N ₃ O	385.31	386
585		C ₂₅ H ₂₅ Cl ₂ N ₃ O	453.14	454
586		C ₂₅ H ₂₆ BrN ₃ O	463.13	464
587		C ₂₅ H ₃₂ ClN ₃ O	425.22	426
588		C ₂₅ H ₃₂ N ₄ O ₂	420.25	421
589		C ₂₄ H ₂₆ N ₄ O ₄	434.20	435
590		C ₂₄ H ₃₀ FN ₃ O ₂	411.23	412
591		C ₂₆ H ₂₈ FN ₃ O	417.22	418
592		C ₂₅ H ₂₅ N ₅ O ₂	427.20	428
593		C ₂₆ H ₂₆ N ₄ O	410.21	411

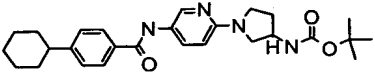
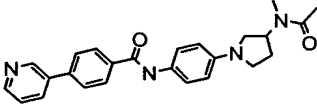
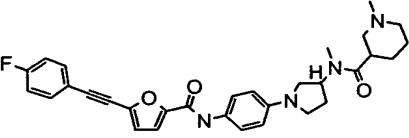
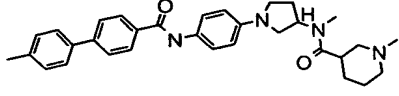
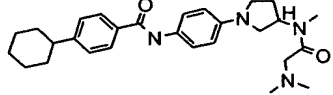
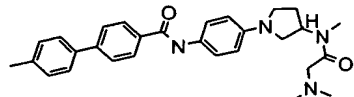
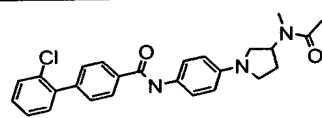
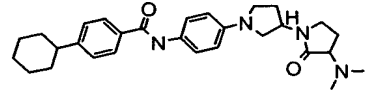
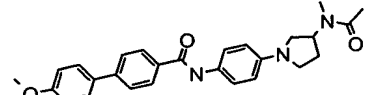
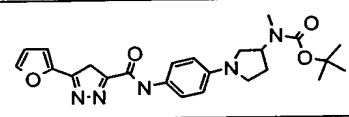
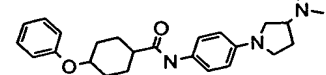
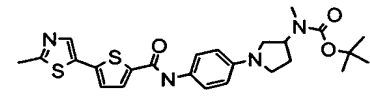
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
594		C ₂₆ H ₃₂ FN ₃ O ₂	437.25	438
595		C ₂₅ H ₂₆ ClN ₃ O	419.18	420
596		C ₂₄ H ₂₆ N ₄ O	386.21	387
597		C ₂₆ H ₂₆ F ₃ N ₃ O	453.20	454
598		C ₂₇ H ₃₁ N ₃ O ₃	445.24	446
599		C ₂₈ H ₂₉ N ₃ O ₃	455.22	456
600		C ₂₄ H ₃₃ N ₃ O ₂	395.26	396
601		C ₂₅ H ₂₇ N ₃ O	385.21	386
602		C ₂₈ H ₃₀ N ₄ O ₂	454.24	455
603		C ₂₆ H ₃₆ N ₄ O ₄	468.27	469
604		C ₂₈ H ₃₈ N ₄ O ₃	478.29	479
605		C ₂₂ H ₂₈ FN ₃ O ₂ S	417.55	418

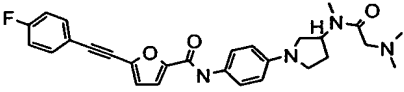
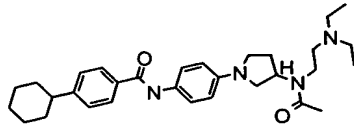
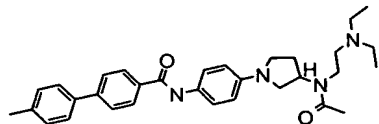
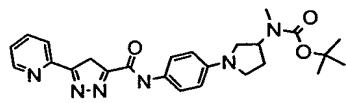
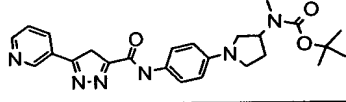
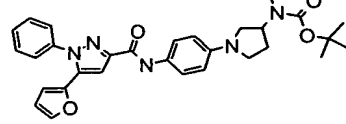
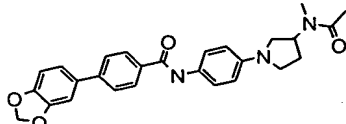
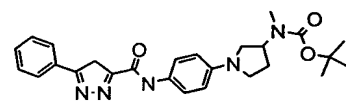
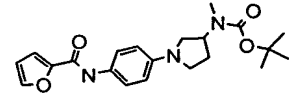
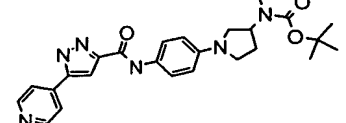
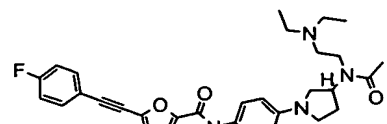
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
606		C ₂₃ H ₂₉ N ₃ O ₃	395.22	396
607		C ₂₇ H ₃₃ N ₃ O ₃	447.25	448
608		C ₂₇ H ₃₇ N ₃ O ₄	467.28	468
609		C ₂₉ H ₃₉ N ₃ O ₃	477.30	478
610		C ₂₇ H ₂₉ FN ₄ O ₃	476.22	477
611		C ₂₅ H ₃₄ N ₄ O ₄	454.26	455
612		C ₂₇ H ₃₅ N ₃ O ₂	433.27	434
613		C ₂₅ H ₃₁ N ₃ O ₃	421.24	422
614		C ₂₈ H ₃₂ N ₄ O ₄	488.24	489
615		C ₂₇ H ₃₅ ClN ₄ O ₃	498.24	499
616		C ₂₆ H ₂₉ N ₅ O ₄	475.22	476
617		C ₂₈ H ₃₆ F ₃ N ₃ O ₄	535.27	536
618		C ₂₇ H ₃₈ N ₄ O ₄	482.29	483

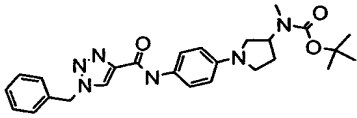
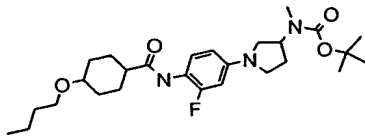
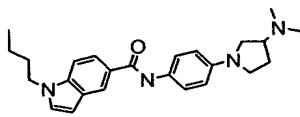
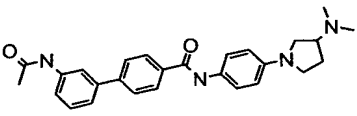
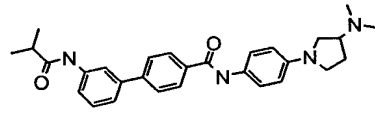
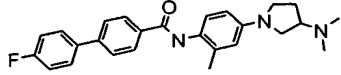
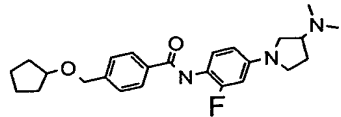
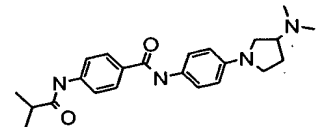
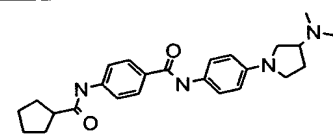
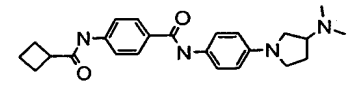
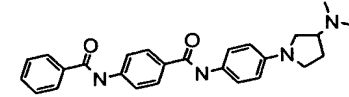
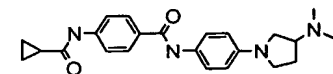
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
619		C ₂₇ H ₃₈ N ₄ O ₄	482.29	483
620		C ₂₈ H ₃₉ N ₃ O ₅	497.29	498
621		C ₂₃ H ₂₃ N ₅ O ₃	417.18	418
622		C ₂₅ H ₂₆ N ₄ O ₂	414.21	415
623		C ₂₈ H ₃₅ ClN ₄ O ₄	526.23	527
624		C ₂₈ H ₃₉ N ₃ O ₄	481.29	482
625		C ₂₇ H ₃₆ ClN ₃ O ₄	501.24	502
626		C ₂₇ H ₃₅ F ₂ N ₃ O ₄	503.26	504
627		C ₂₇ H ₃₆ FN ₃ O ₄	485.27	486
628		C ₂₇ H ₃₆ FN ₃ O ₄	485.27	486

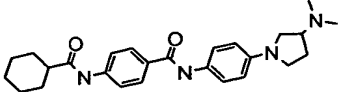
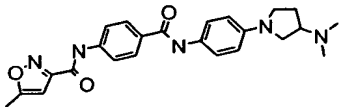
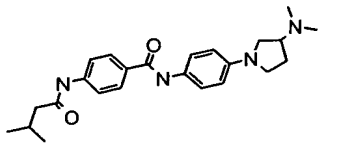
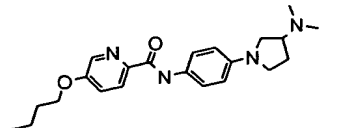
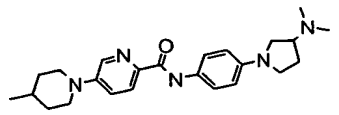
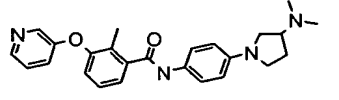
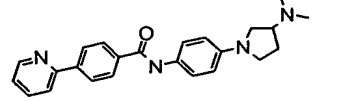
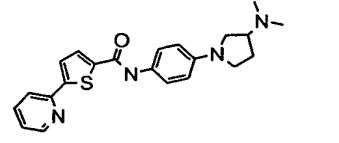
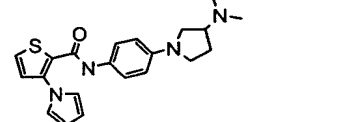
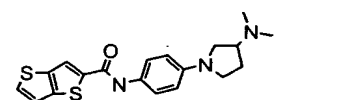
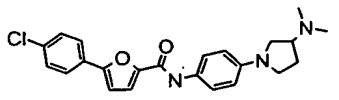
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
629		C ₂₈ H ₃₉ N ₃ O ₄	481.29	482
630		C ₂₈ H ₃₆ F ₃ N ₃ O ₄	535.27	536
631		C ₂₇ H ₃₅ ClF ₁ N ₃ O ₄	519.23	520
632		C ₂₈ H ₃₆ N ₄ O ₄	492.27	493
633		C ₂₈ H ₃₈ ClN ₃ O ₄	515.26	516
634		C ₃₁ H ₃₉ N ₃ O ₄	517.29	518
635		C ₂₇ H ₃₆ BrN ₃ O ₄	545.19	546
636		C ₂₈ H ₃₆ N ₄ O ₄	492.27	493
637		C ₂₆ H ₃₅ ClN ₄ O ₄	502.23	503
638		C ₂₇ H ₃₅ F ₂ N ₃ O ₄	503.26	504

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
639		C ₂₇ H ₃₆ BrN ₃ O ₄	545.19	546
640		C ₂₇ H ₃₅ F ₂ N ₃ O ₄	503.26	504
641		C ₂₃ H ₃₁ N ₃ O ₃	397.24	398
642		C ₂₄ H ₃₃ N ₃ O ₃	411.25	412
643		C ₂₇ H ₃₇ N ₃ O ₅	483.27	484
644		C ₂₅ H ₃₄ N ₄ O ₄	454.26	455
645		C ₂₇ H ₃₆ FN ₃ O ₄	485.27	486
646		C ₂₇ H ₂₄ FN ₃ O ₃	457.18	458
647		C ₂₇ H ₃₃ N ₃ O ₂	431.26	432
648		C ₂₃ H ₃₁ N ₃ O ₃	397.24	398
649		C ₂₅ H ₂₄ FN ₃ O ₂	417.18	418

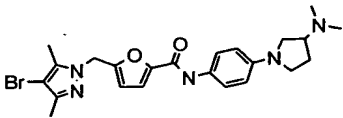
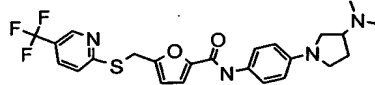
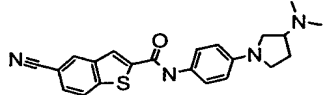
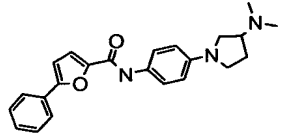
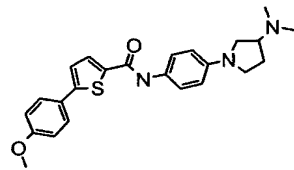
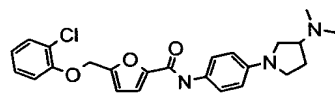
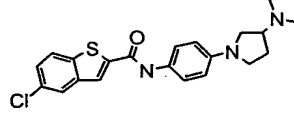
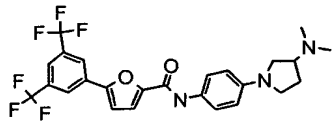
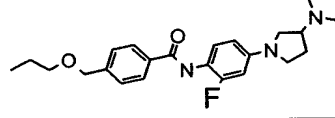
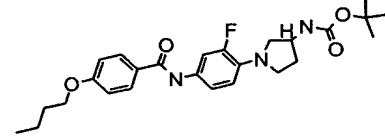
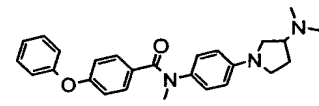
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
650		C ₂₇ H ₃₆ N ₄ O ₃	464.28	465
651		C ₂₅ H ₂₆ N ₄ O ₂	414.21	415
652		C ₃₁ H ₃₃ FN ₄ O ₃	528.25	529
653		C ₃₂ H ₃₈ N ₄ O ₂	510.30	511
654		C ₂₈ H ₃₈ N ₄ O ₂	462.30	463
655		C ₂₉ H ₃₄ N ₄ O ₂	470.27	471
656		C ₂₆ H ₂₆ ClN ₃ O ₂	447.17	448
657		C ₂₉ H ₃₈ N ₄ O ₂	474.30	475
658		C ₂₇ H ₂₉ N ₃ O ₃	443.22	444
659		C ₂₄ H ₂₉ N ₅ O ₄	451.22	452
660		C ₂₅ H ₃₃ N ₃ O ₂	407.26	408
661		C ₂₅ H ₃₀ N ₄ O ₃ S ₂	498.18	499

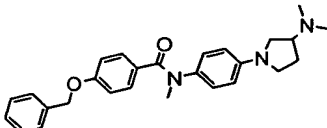
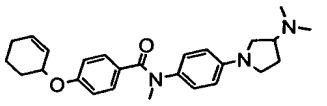
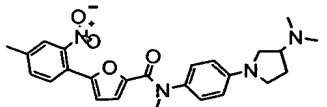
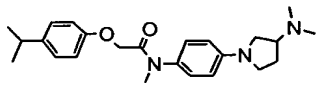
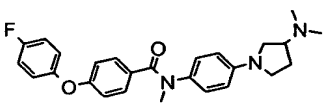
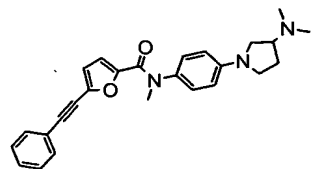
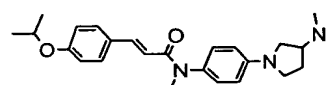
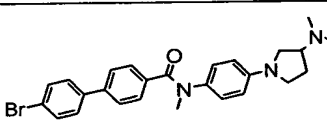
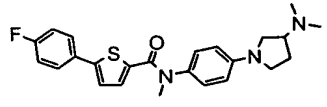
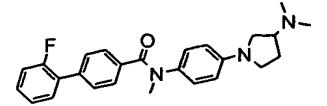
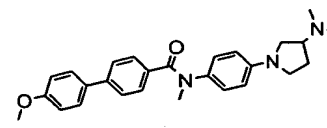
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
662		C ₂₈ H ₂₉ FN ₄ O ₃	488.22	489
663		C ₃₁ H ₄₄ N ₄ O ₂	504.35	505
664		C ₃₂ H ₄₀ N ₄ O ₂	512.32	513
665		C ₂₅ H ₃₀ N ₆ O ₃	462.24	463
666		C ₂₅ H ₃₀ N ₆ O ₃	462.24	463
667		C ₃₀ H ₃₃ N ₅ O ₄	527.25	528
668		C ₂₇ H ₂₇ N ₃ O ₄	457.20	458
669		C ₂₆ H ₃₁ N ₅ O ₃	461.24	462
670		C ₂₁ H ₂₇ N ₃ O ₄	385.20	386
671		C ₂₅ H ₃₀ N ₆ O ₃	462.24	463
672		C ₃₁ H ₃₅ FN ₄ O ₃	530.27	531

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
673		C ₂₆ H ₃₂ N ₆ O ₃	476.25	477
674		C ₂₇ H ₄₂ FN ₃ O ₄	491.32	492
675		C ₂₅ H ₃₂ N ₄ O	404.26	405
676		C ₂₇ H ₃₀ N ₄ O ₂	442.24	443
677		C ₂₉ H ₃₄ N ₄ O ₂	470.27	471
678		C ₂₆ H ₂₈ FN ₃ O	417.22	418
679		C ₂₅ H ₃₂ FN ₃ O ₂	425.55	426
680		C ₂₃ H ₃₀ N ₄ O ₂	394.24	395
681		C ₂₅ H ₃₂ N ₄ O ₂	420.25	421
682		C ₂₄ H ₃₀ N ₄ O ₂	406.24	407
683		C ₂₆ H ₂₈ N ₄ O ₂	428.22	429
684		C ₂₃ H ₂₈ N ₄ O ₂	392.22	393

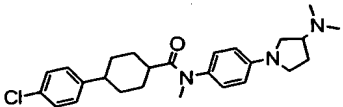
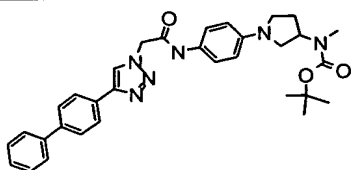
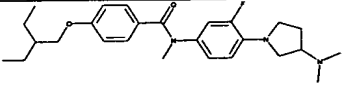
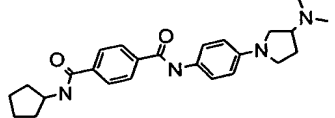
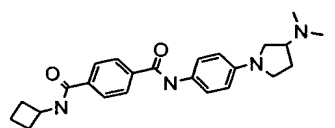
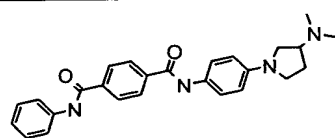
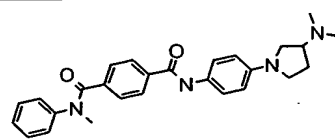
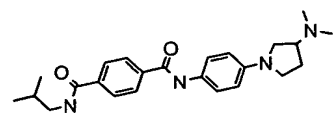
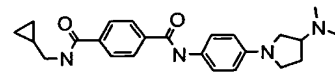
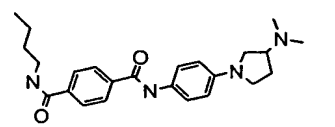
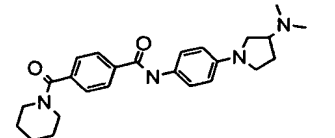
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
685		C ₂₆ H ₃₄ N ₄ O ₂	434.27	435
686		C ₂₄ H ₂₇ N ₅ O ₃	433.21	434
687		C ₂₄ H ₃₂ N ₄ O ₂	408.25	409
688		C ₂₂ H ₃₀ N ₄ O ₂	382.24	383
689		C ₂₄ H ₃₃ N ₅ O	407.27	408
690		C ₂₅ H ₂₈ N ₄ O ₂	416.22	417
691		C ₂₄ H ₂₆ N ₄ O	386.21	387
692		C ₂₂ H ₂₄ N ₄ OS	392.17	393
693		C ₂₁ H ₂₄ N ₄ OS	380.17	381
694		C ₁₉ H ₂₁ N ₃ OS ₂	371.11	372
695		C ₂₃ H ₂₄ ClN ₃ O ₂	409.16	410

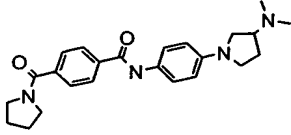
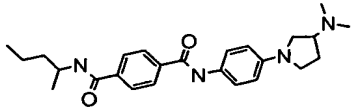
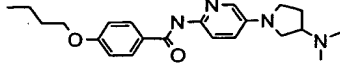
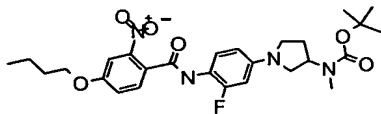
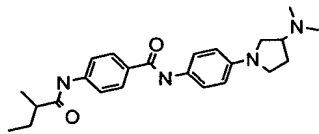
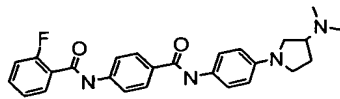
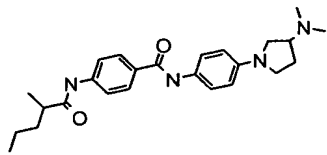
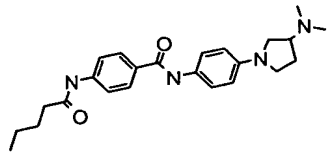
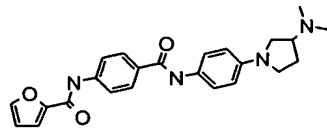
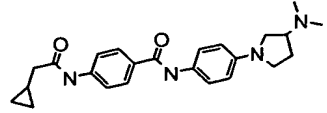
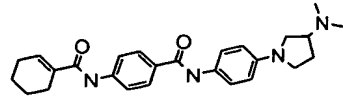
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
696		C22H24ClN3OS	413.13	414
697		C21H21ClFN3OS	417.11	418
698		C21H21Cl2N3OS	433.08	434
699		C21H21ClN4O3S	444.10	445
700		C22H23Cl2N3O2S	463.09	464
701		C22H24ClN3O2S	429.13	430
702		C23H26ClN3OS	427.15	428
703		C24H26ClN3O2S	455.14	456
704		C22H24F3N5OS	463.17	464
705		C24H23ClF3N3O2	477.14	478
706		C24H24F3N3O2	443.18	444

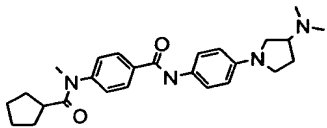
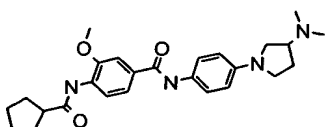
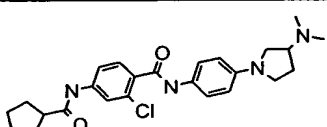
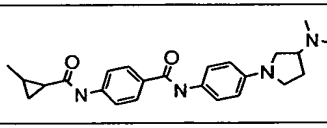
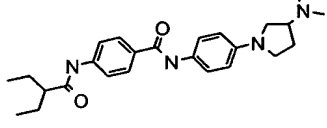
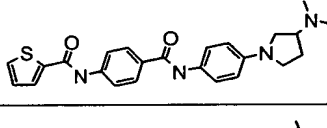
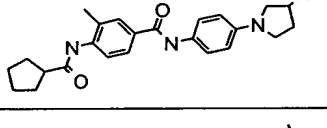
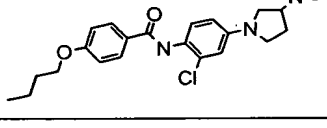
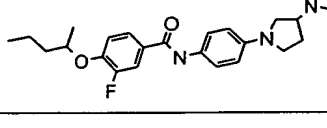
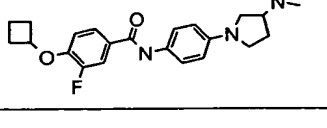
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
707		C ₂₃ H ₂₈ BrN ₅ O ₂	485.14	486
708		C ₂₄ H ₂₅ F ₃ N ₄ O ₂ S	490.17	491
709		C ₂₂ H ₂₂ N ₄ O ₂ S	390.15	391
710		C ₂₃ H ₂₅ N ₃ O ₂	375.20	376
711		C ₂₄ H ₂₇ N ₃ O ₂ S	421.18	422
712		C ₂₄ H ₂₆ ClN ₃ O ₃	439.17	440
713		C ₂₁ H ₂₂ ClN ₃ O ₂ S	399.12	400
714		C ₂₅ H ₂₃ F ₆ N ₃ O ₂	511.17	512
715		C ₂₃ H ₃₀ FN ₃ O ₂	399.51	400
716		C ₂₆ H ₃₄ FN ₃ O ₄	471.25	472
717		C ₂₆ H ₂₉ N ₃ O ₂	415.23	416

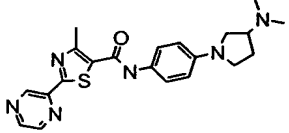
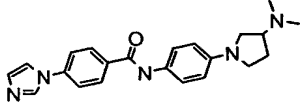
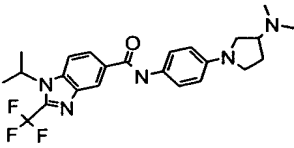
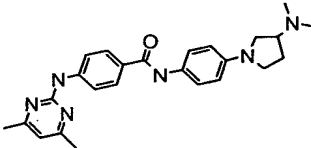
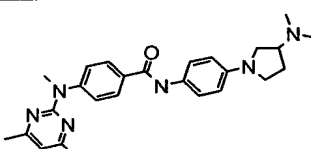
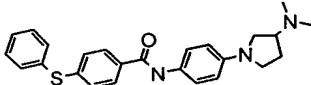
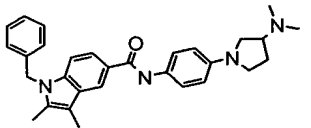
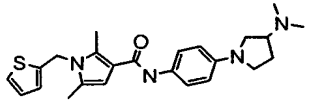
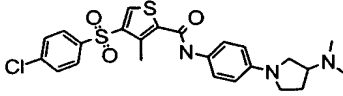
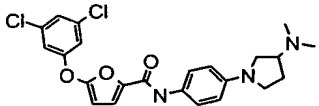
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
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719		C ₂₆ H ₃₃ N ₃ O ₂	419.26	420
720		C ₂₅ H ₂₈ N ₄ O ₄	448.21	449
721		C ₂₄ H ₃₃ N ₃ O ₂	395.26	396
722		C ₂₆ H ₂₈ FN ₃ O ₂	433.22	434
723		C ₂₆ H ₂₇ N ₃ O ₂	413.21	414
724		C ₂₅ H ₃₃ N ₃ O ₂	407.26	408
725		C ₂₆ H ₂₈ BrN ₃ O	477.14	478
726		C ₂₄ H ₂₆ FN ₃ OS	423.18	424
727		C ₂₆ H ₂₈ FN ₃ O	417.22	418
728		C ₂₇ H ₃₁ N ₃ O ₂	429.24	430

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
729		C ₂₆ H ₂₈ ClN ₃ O	433.19	434
730		C ₂₆ H ₂₈ ClN ₃ O	433.19	434
731		C ₂₆ H ₂₈ ClN ₃ O	433.19	434
732		C ₂₄ H ₂₅ ClN ₄ O ₄	468.16	469
733		C ₂₆ H ₂₈ FN ₃ O	417.22	418
734		C ₂₇ H ₂₉ N ₃ O ₃	443.22	444
735		C ₂₇ H ₃₁ N ₃ O	413.25	414
736		C ₂₇ H ₃₁ N ₃ O	413.25	414
737		C ₂₆ H ₂₆ FN ₃ O ₂	431.20	432
738		C ₂₇ H ₂₉ N ₃ O ₂	427.23	428
739		C ₂₅ H ₃₅ N ₃ O ₂	409.27	410

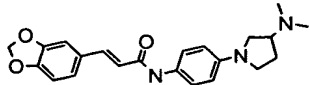
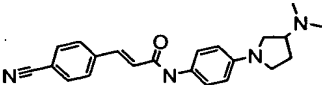
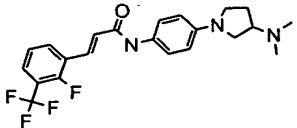
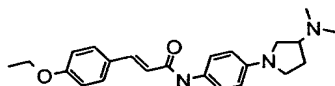
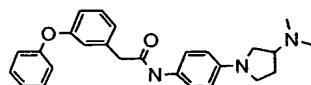
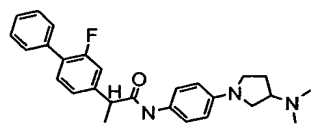
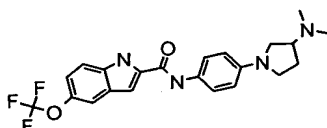
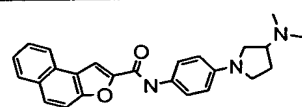
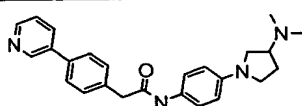
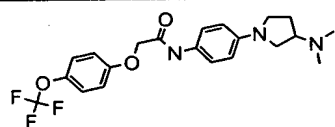
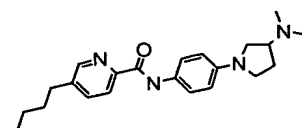
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
740		C ₂₆ H ₃₄ ClN ₃ O	439.24	440
741		C ₃₂ H ₃₆ N ₆ O ₃	552.28	553
742		C ₂₆ H ₃₆ FN ₃ O ₂	411.59	412
743		C ₂₅ H ₃₂ N ₄ O ₂	420.25	421
744		C ₂₄ H ₃₀ N ₄ O ₂	406.24	407
745		C ₂₆ H ₂₈ N ₄ O ₂	428.22	429
746		C ₂₇ H ₃₀ N ₄ O ₂	442.24	443
747		C ₂₄ H ₃₂ N ₄ O ₂	408.25	409
748		C ₂₄ H ₃₀ N ₄ O ₂	406.24	407
749		C ₂₄ H ₃₂ N ₄ O ₂	408.25	409
750		C ₂₅ H ₃₂ N ₄ O ₂	420.25	421

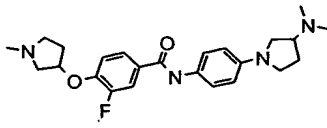
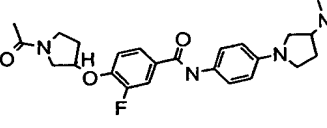
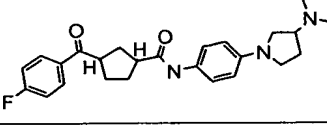
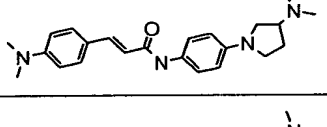
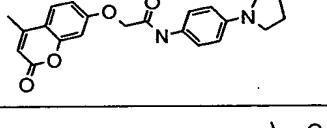
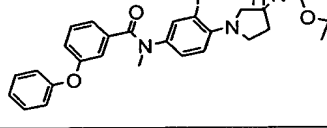
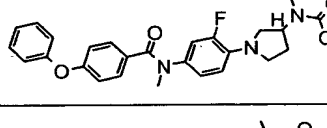
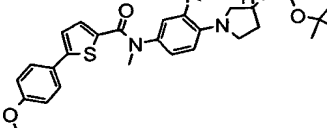
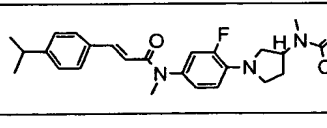
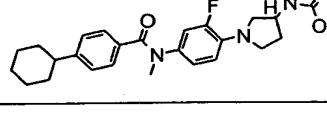
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
751		C ₂₄ H ₃₀ N ₄ O ₂	406.24	407
752		C ₂₅ H ₃₄ N ₄ O ₂	422.27	423
753		C ₂₂ H ₃₀ N ₄ O ₂	382.24	383
754		C ₂₇ H ₃₅ FN ₄ O ₆	530.25	531
755		C ₂₄ H ₃₂ N ₄ O ₂	408.25	409
756		C ₂₆ H ₂₇ FN ₄ O ₂	446.21	447
757		C ₂₅ H ₃₄ N ₄ O ₂	422.27	423
758		C ₂₄ H ₃₂ N ₄ O ₂	408.25	409
759		C ₂₄ H ₂₆ N ₄ O ₃	418.20	419
760		C ₂₄ H ₃₀ N ₄ O ₂	406.24	407
761		C ₂₆ H ₃₂ N ₄ O ₂	432.25	433

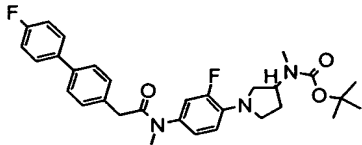
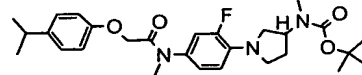
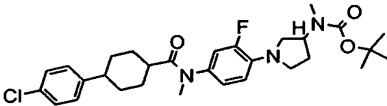
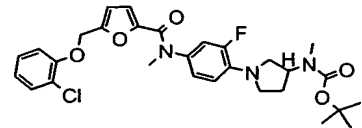
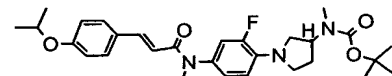
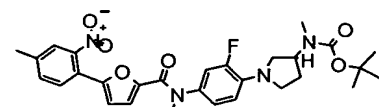
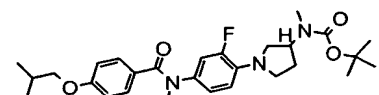
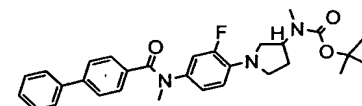
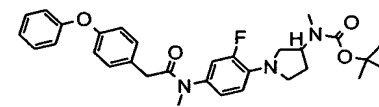
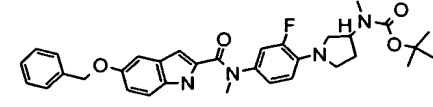
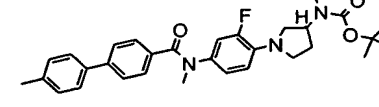
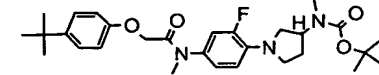
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
762		C ₂₆ H ₃₄ N ₄ O ₂	434.27	435
763		C ₂₆ H ₃₄ N ₄ O ₃	450.26	451
764		C ₂₅ H ₃₁ ClN ₄ O ₂	454.21	455
765		C ₂₄ H ₃₀ N ₄ O ₂	406.24	407
766		C ₂₅ H ₃₄ N ₄ O ₂	422.27	423
767		C ₂₄ H ₂₆ N ₄ O ₂ S	434.18	435
768		C ₂₆ H ₃₄ N ₄ O ₂	434.27	435
769		C ₂₃ H ₃₀ ClN ₃ O ₂	415.20	416
770		C ₂₄ H ₃₂ FN ₃ O ₂	413.25	414
771		C ₂₃ H ₂₈ FN ₃ O ₂	397.22	398

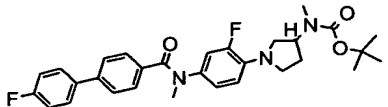
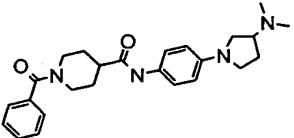
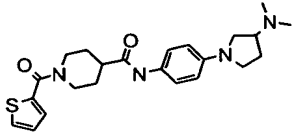
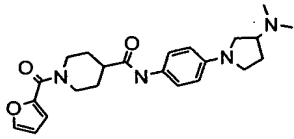
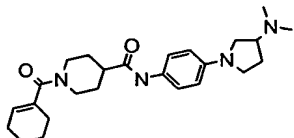
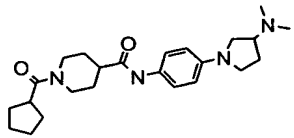
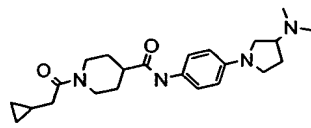
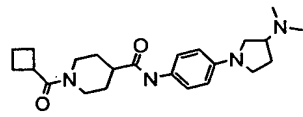
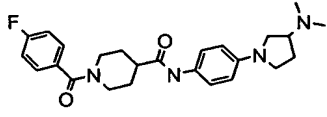
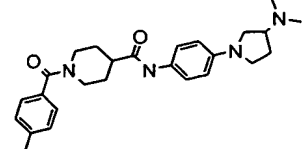
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
782		C ₂₁ H ₂₄ N ₆ OS	408.17	409
783		C ₂₂ H ₂₅ N ₅ O	375.21	376
784		C ₂₄ H ₂₈ F ₃ N ₅ O	459.23	460
785		C ₂₅ H ₃₀ N ₆ O	430.25	431
786		C ₂₆ H ₃₂ N ₆ O	444.26	445
787		C ₂₅ H ₂₇ N ₃ OS	417.19	418
788		C ₃₀ H ₃₄ N ₄ O	466.27	467
789		C ₂₄ H ₃₀ N ₄ OS	422.21	423
790		C ₂₄ H ₂₆ ClN ₃ O ₃ S 2	503.11	504
791		C ₂₃ H ₂₃ Cl ₂ N ₃ O ₃	459.11	460

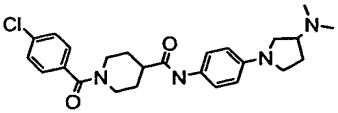
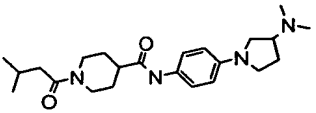
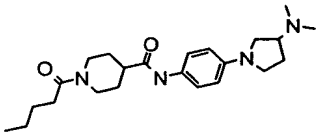
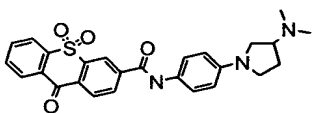
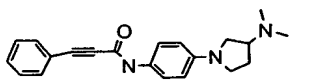
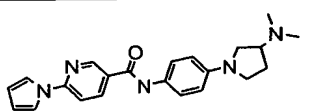
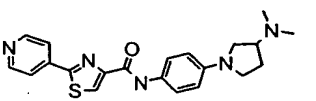
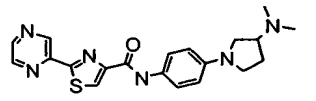
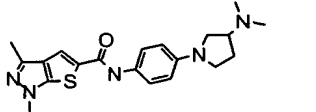
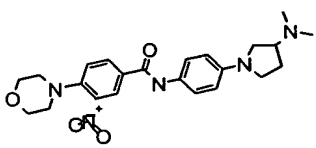
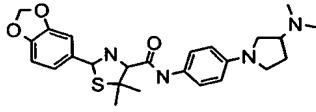
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
792		C ₂₄ H ₂₆ ClN ₃ O ₂	423.17	424
793		C ₂₃ H ₂₆ N ₄ OS	406.18	407
794		C ₂₅ H ₂₇ N ₃ O ₃ S	449.18	450
795		C ₂₃ H ₂₅ ClN ₄ OS	440.14	441
796		C ₂₃ H ₂₅ N ₃ O ₃	391.19	392
797		C ₂₃ H ₂₃ F ₃ N ₄ O ₂	444.18	445
798		C ₂₃ H ₂₈ N ₄ O ₃	408.22	409
799		C ₂₅ H ₃₀ N ₄ O	402.24	403
800		C ₂₆ H ₂₉ N ₃ O ₂	415.23	416
801		C ₂₇ H ₂₉ N ₅ O	439.24	440
802		C ₂₂ H ₂₄ F ₃ N ₃ O ₂	419.18	420

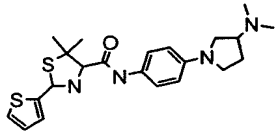
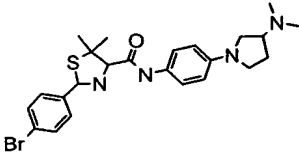
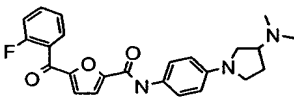
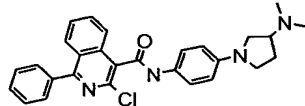
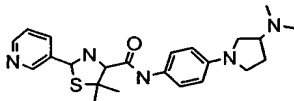
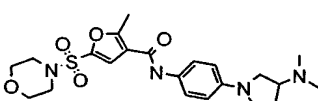
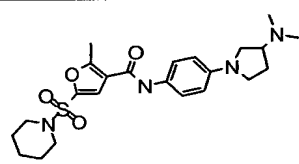
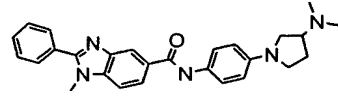
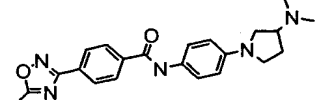
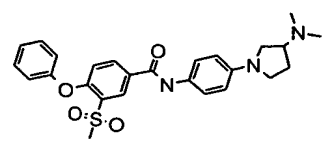
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
803		C ₂₂ H ₂₅ N ₃ O ₃	379.19	380
804		C ₂₂ H ₂₄ N ₄ O	360.20	361
805		C ₂₂ H ₂₃ F ₄ N ₃ O	421.18	422
806		C ₂₃ H ₂₉ N ₃ O ₂	379.23	380
807		C ₂₆ H ₂₉ N ₃ O ₂	415.23	416
808		C ₂₇ H ₃₀ FN ₃ O	431.24	432
809		C ₂₂ H ₂₃ F ₃ N ₄ O ₂	432.18	433
810		C ₂₅ H ₂₅ N ₃ O ₂	399.20	400
811		C ₂₅ H ₂₈ N ₄ O	400.23	401
812		C ₂₁ H ₂₄ F ₃ N ₃ O ₃	423.18	424
813		C ₂₂ H ₃₀ N ₄ O	366.24	367

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
814		C ₂₄ H ₃₁ FN ₄ O ₂	426.24	427
815		C ₂₅ H ₃₁ FN ₄ O ₃	454.24	455
816		C ₂₅ H ₃₀ FN ₃ O ₂	423.23	424
817		C ₂₃ H ₃₀ N ₄ O	378.24	379
818		C ₂₄ H ₂₇ N ₃ O ₄	421.20	422
819		C ₃₀ H ₃₄ FN ₃ O ₄	519.25	520
820		C ₃₀ H ₃₄ FN ₃ O ₄	519.25	520
821		C ₂₉ H ₃₄ FN ₃ O ₄ S	539.22	540
822		C ₂₉ H ₃₈ FN ₃ O ₃	495.29	496
823		C ₃₀ H ₄₀ FN ₃ O ₃	509.30	510

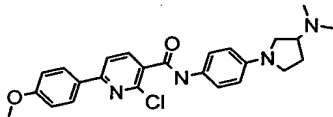
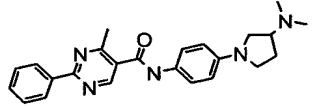
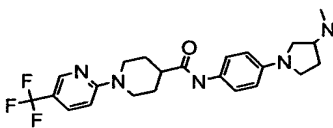
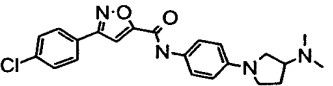
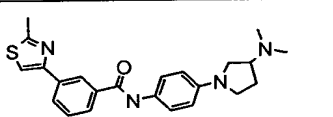
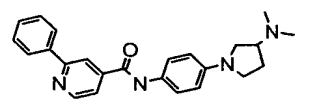
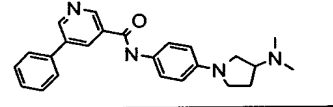
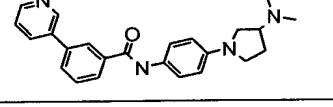
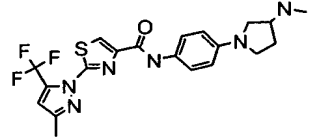
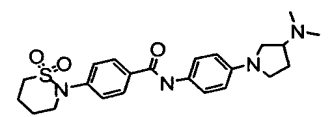
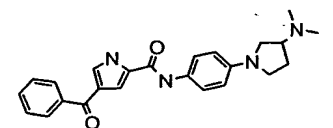
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
824		C ₃₁ H ₃₅ F ₂ N ₃ O ₃	535.27	536
825		C ₂₈ H ₃₈ FN ₃ O ₄	499.29	500
826		C ₃₀ H ₃₉ ClFN ₃ O ₃	543.27	544
827		C ₂₉ H ₃₃ ClFN ₃ O ₅	557.21	558
828		C ₂₉ H ₃₈ FN ₃ O ₄	511.29	512
829		C ₂₉ H ₃₃ FN ₄ O ₆	552.24	553
830		C ₂₈ H ₃₈ FN ₃ O ₄	499.29	500
831		C ₃₀ H ₃₄ FN ₃ O ₃	503.26	504
832		C ₃₁ H ₃₆ FN ₃ O ₄	533.27	534
833		C ₃₃ H ₃₇ FN ₄ O ₄	572.28	573
834		C ₃₁ H ₃₆ FN ₃ O ₃	517.27	518
835		C ₂₉ H ₄₀ FN ₃ O ₄	513.30	514

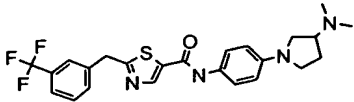
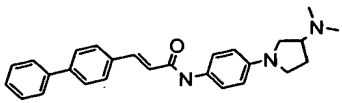
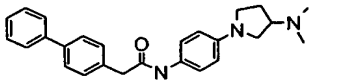
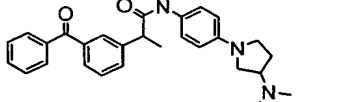
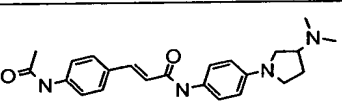
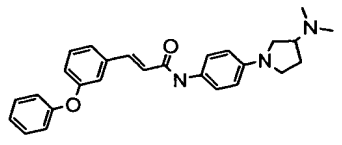
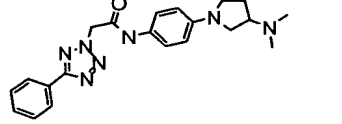
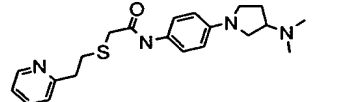
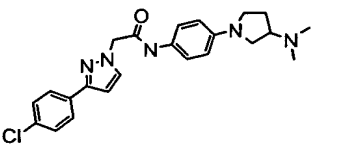
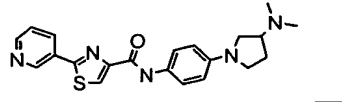
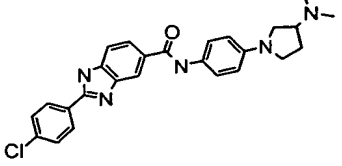
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
836		C ₃₀ H ₃₃ F ₂ N ₃ O ₃	521.25	522
837		C ₂₅ H ₃₂ N ₄ O ₂	420.25	421
838		C ₂₃ H ₃₀ N ₄ O ₂ S	426.21	427
839		C ₂₃ H ₃₀ N ₄ O ₃	410.23	411
840		C ₂₅ H ₃₆ N ₄ O ₂	424.28	425
841		C ₂₄ H ₃₆ N ₄ O ₂	412.28	413
842		C ₂₃ H ₃₄ N ₄ O ₂	398.27	399
843		C ₂₃ H ₃₄ N ₄ O ₂	398.27	399
844		C ₂₅ H ₃₁ FN ₄ O ₂	438.24	439
845		C ₂₆ H ₃₄ N ₄ O ₂	434.27	435

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
846		C ₂₅ H ₃₁ ClN ₄ O ₂	454.21	455
847		C ₂₃ H ₃₆ N ₄ O ₂	400.28	401
848		C ₂₃ H ₃₆ N ₄ O ₂	400.28	401
849		C ₂₆ H ₂₅ N ₃ O ₄ S	475.16	476
850		C ₂₁ H ₂₃ N ₃ O	333.18	334
851		C ₂₂ H ₂₅ N ₅ O	375.21	376
852		C ₂₁ H ₂₃ N ₅ OS	393.16	394
853		C ₂₀ H ₂₂ N ₆ OS	394.16	395
854		C ₂₀ H ₂₅ N ₅ OS	383.18	384
855		C ₂₃ H ₂₉ N ₅ O ₄	439.22	440
856		C ₂₅ H ₃₂ N ₄ O ₃ S	468.22	469

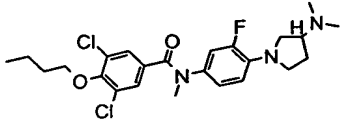
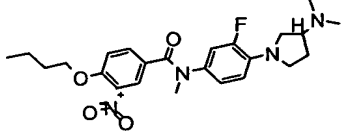
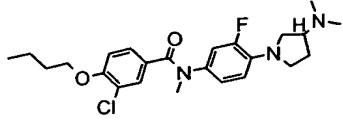
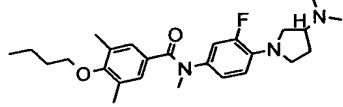
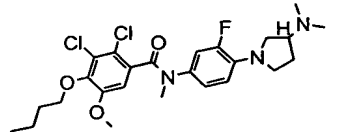
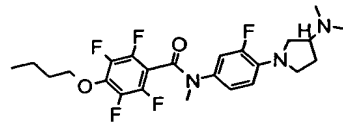
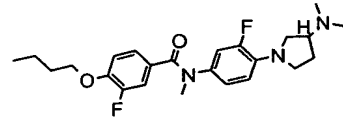
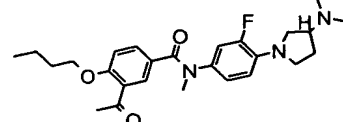
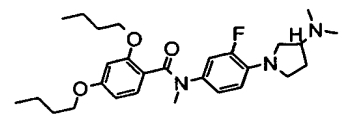
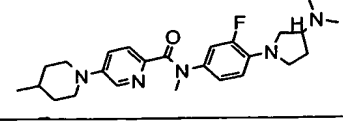
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
857		C ₂₂ H ₃₀ N ₄ OS ₂	430.19	431
858		C ₂₄ H ₃₁ BrN ₄ OS	502.14	503
859		C ₂₄ H ₂₄ FN ₃ O ₃	421.18	422
860		C ₂₈ H ₂₇ ClN ₄ O	470.19	471
861		C ₂₃ H ₃₁ N ₅ OS	425.23	426
862		C ₂₂ H ₃₀ N ₄ O ₅ S	462.19	463
863		C ₂₃ H ₃₂ N ₄ O ₄ S	460.21	461
864		C ₂₇ H ₂₉ N ₅ O	439.24	440
865		C ₂₂ H ₂₅ N ₅ O ₂	391.20	392
866		C ₂₆ H ₂₉ N ₃ O ₄ S	479.19	480

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
867		C23H23F3N4OS	460.15	461
868		C22H29N7O2	423.24	424
869		C25H26N6O	426.22	427
870		C26H32N4O2	432.25	433
871		C24H27N3O2	389.21	390
872		C27H29N5O	439.24	440
873		C23H28N4O3S	440.19	441
874		C28H34N4OS	474.24	475
875		C24H28N4O3S	452.19	453
876		C23H23ClN4O3	438.15	439
877		C23H26FN5O	407.21	408

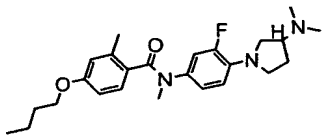
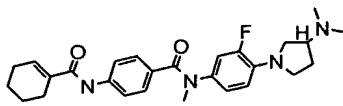
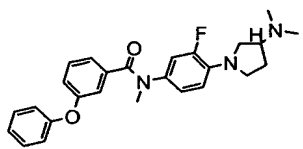
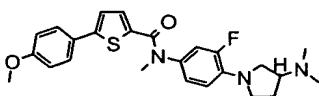
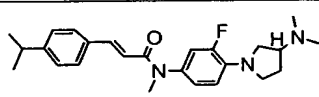
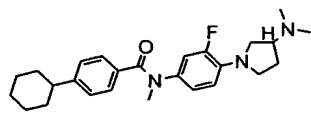
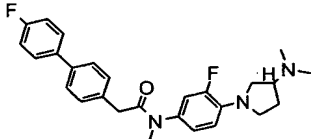
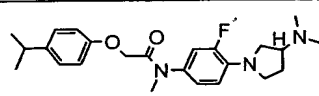
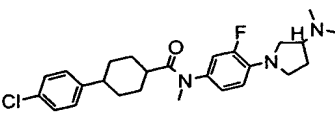
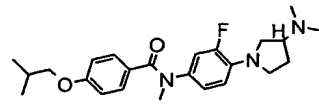
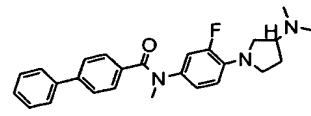
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
878		C ₂₅ H ₂₇ ClN ₄ O ₂	450.18	451
879		C ₂₄ H ₂₇ N ₅ O	401.22	402
880		C ₂₄ H ₃₀ F ₃ N ₅ O	461.24	462
881		C ₂₂ H ₂₃ ClN ₄ O ₂	410.15	411
882		C ₂₃ H ₂₆ N ₄ OS	406.18	407
883		C ₂₄ H ₂₆ N ₄ O	386.21	387
884		C ₂₄ H ₂₆ N ₄ O	386.21	387
885		C ₂₄ H ₂₆ N ₄ O	386.21	387
886		C ₂₁ H ₂₃ F ₃ N ₆ OS	464.16	465
887		C ₂₃ H ₃₀ N ₄ O ₃ S	442.20	443
888		C ₂₄ H ₂₆ N ₄ O ₂	402.21	403

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
889		C ₂₄ H ₂₅ F ₃ N ₄ OS	474.17	475
890		C ₂₇ H ₂₉ N ₃ O	411.23	412
891		C ₂₆ H ₂₉ N ₃ O	399.23	400
892		C ₂₈ H ₃₁ N ₃ O ₂	441.24	442
893		C ₂₃ H ₂₈ N ₄ O ₂	392.22	393
894		C ₂₇ H ₂₉ N ₃ O ₂	427.23	428
895		C ₂₁ H ₂₅ N ₇ O	391.21	392
896		C ₂₁ H ₂₈ N ₄ OS	384.20	385
897		C ₂₃ H ₂₆ ClN ₅ O	423.18	424
898		C ₂₁ H ₂₃ N ₅ OS	393.16	394
899		C ₂₆ H ₂₆ ClN ₅ O	459.18	460

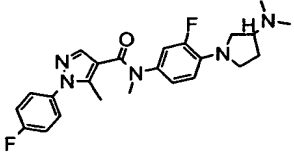
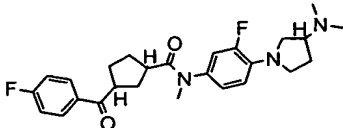
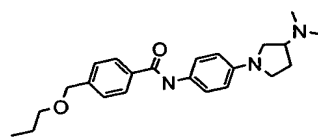
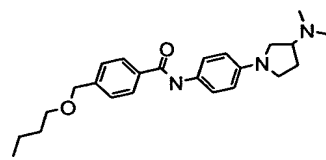
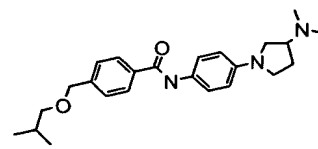
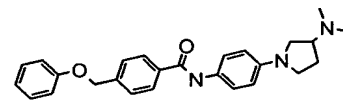
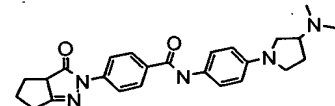
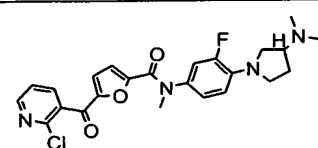
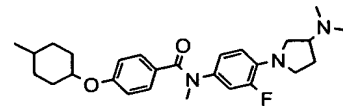
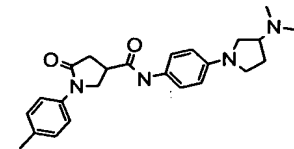
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
900		C ₂₃ H ₂₇ N ₅ O	389.22	390
901		C ₂₅ H ₃₄ N ₄ O	406.27	407
902		C ₂₄ H ₃₀ N ₄ O ₂	406.24	407
903		C ₂₃ H ₃₀ ClN ₃ O ₂	415.20	416
904		C ₂₅ H ₂₅ F ₂ N ₃ O ₂	437.19	438
905		C ₂₉ H ₃₉ FN ₄ O ₂	494.31	495
906		C ₂₉ H ₃₂ F ₂ N ₄ O ₂	506.25	507
907		C ₃₀ H ₃₅ FN ₄ O ₂	502.27	503
908		C ₂₇ H ₃₇ FN ₄ O ₃	484.29	485
909		C ₂₇ H ₃₇ FN ₄ O ₃	484.29	485
910		C ₂₅ H ₃₄ FN ₃ O ₃	443.26	444

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
911		C ₂₄ H ₃₀ Cl ₂ FN ₃ O ₂	481.17	482
912		C ₂₄ H ₃₁ FN ₄ O ₄	458.23	459
913		C ₂₄ H ₃₁ ClFN ₃ O ₂	447.21	448
914		C ₂₆ H ₃₆ FN ₃ O ₂	441.28	442
915		C ₂₅ H ₃₂ Cl ₂ FN ₃ O ₃	511.18	512
916		C ₂₄ H ₂₈ F ₅ N ₃ O ₂	485.21	486
917		C ₂₄ H ₃₁ F ₂ N ₃ O ₂	431.24	432
918		C ₂₆ H ₃₄ FN ₃ O ₃	455.26	456
919		C ₂₈ H ₄₀ FN ₃ O ₃	485.30	486
920		C ₂₅ H ₃₄ FN ₅ O	439.27	440

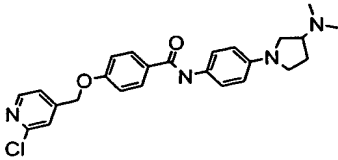
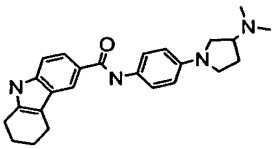
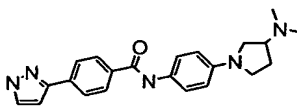
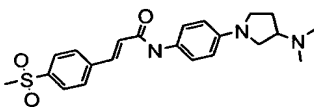
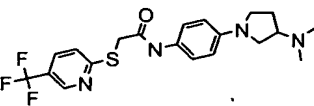
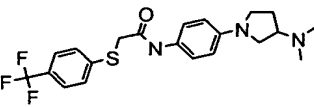
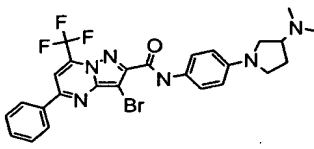
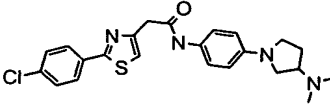
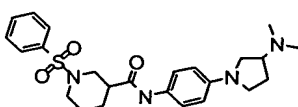
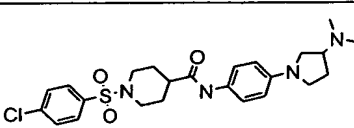
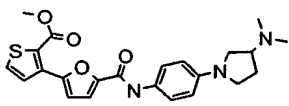
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
921		C ₂₃ H ₃₁ FN ₄ O ₂	414.24	415
922		C ₂₄ H ₂₆ FN ₃ O ₃	423.20	424
923		C ₂₆ H ₂₈ FN ₃ O ₂	433.22	434
924		C ₂₆ H ₃₃ FN ₄ O ₂	452.26	453
925		C ₂₆ H ₃₂ ClFN ₄ O ₂	486.22	487
926		C ₂₅ H ₃₁ FN ₄ O ₂	438.24	439
927		C ₂₆ H ₃₁ F ₃ N ₄ O ₃	504.23	505
928		C ₂₆ H ₃₃ ClN ₄ O ₃	484.22	485
929		C ₂₅ H ₃₁ ClN ₄ O ₂	454.21	455
930		C ₂₄ H ₃₁ ClFN ₃ O ₂	447.21	448

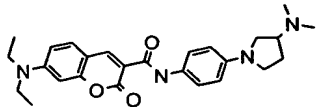
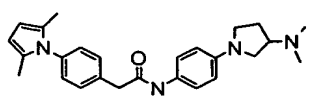
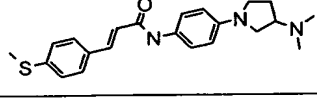
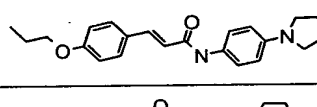
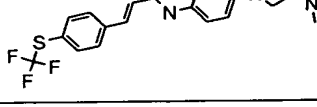
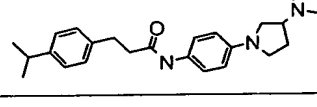
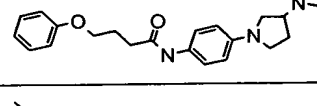
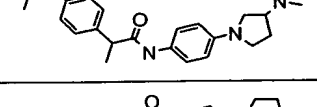
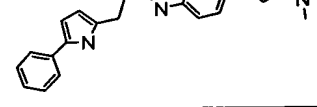
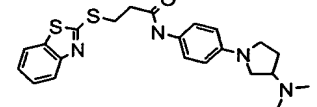
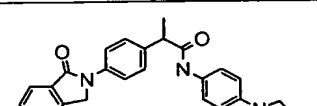
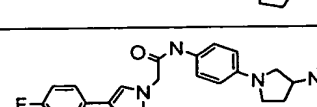
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
931		C ₂₅ H ₃₄ FN ₃ O ₂	427.26	428
932		C ₂₇ H ₃₃ FN ₄ O ₂	464.26	465
933		C ₂₆ H ₂₈ FN ₃ O ₂	433.22	434
934		C ₂₅ H ₂₈ FN ₃ O ₂ S	453.19	454
935		C ₂₅ H ₃₂ FN ₃ O	409.25	410
936		C ₂₆ H ₃₄ FN ₃ O	423.27	424
937		C ₂₇ H ₂₉ F ₂ N ₃ O	449.23	450
938		C ₂₄ H ₃₂ FN ₃ O ₂	413.25	414
939		C ₂₆ H ₃₃ ClFN ₃ O	457.23	458
940		C ₂₄ H ₃₂ FN ₃ O ₂	413.25	414
941		C ₂₆ H ₂₈ FN ₃ O	417.22	418

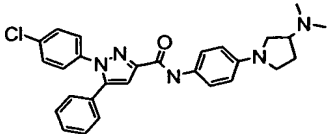
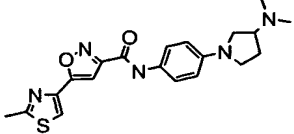
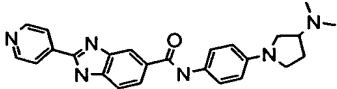
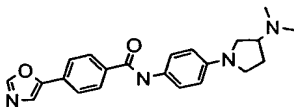
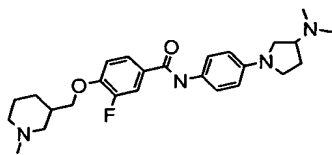
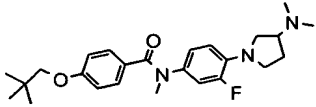
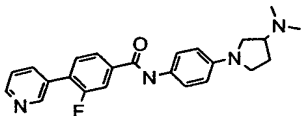
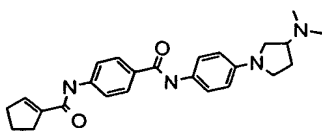
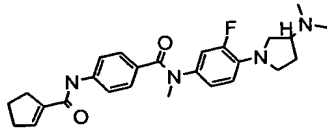
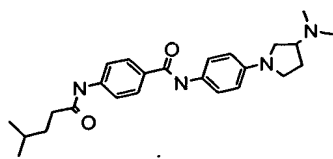
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
942		C ₂₇ H ₃₀ FN ₃ O ₂	447.23	448
943		C ₂₉ H ₃₁ FN ₄ O ₂	486.24	487
944		C ₂₇ H ₃₀ FN ₃ O	431.24	432
945		C ₂₅ H ₃₄ FN ₃ O ₂	427.26	428
946		C ₂₆ H ₂₇ F ₂ N ₃ O	435.21	436
947		C ₂₅ H ₂₇ FN ₄ O ₂	434.52	435
948		C ₂₅ H ₂₇ FN ₄ O ₄	466.20	467
949		C ₂₄ H ₂₉ FN ₄ O ₃	440.22	441
950		C ₂₇ H ₃₀ FN ₃ O ₂	447.23	448
951		C ₂₃ H ₃₁ FN ₄ O	398.25	399
952		C ₂₄ H ₂₆ ClFN ₄ OS	472.15	473
953		C ₂₅ H ₂₅ F ₂ N ₃ O ₃	453.19	454

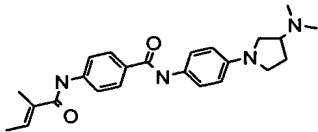
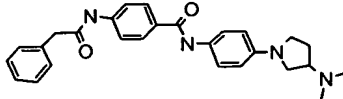
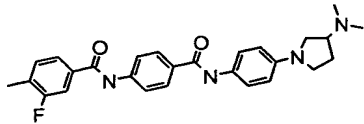
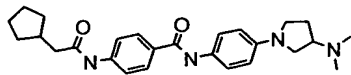
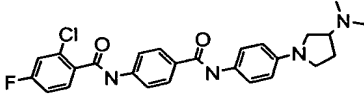
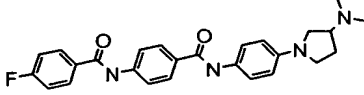
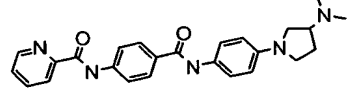
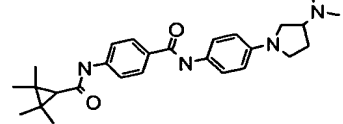
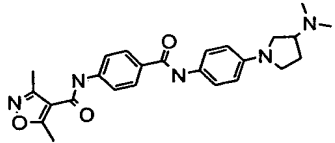
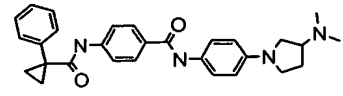
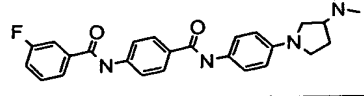
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
954		C ₂₄ H ₂₇ F ₂ N ₅ O	439.22	440
955		C ₂₆ H ₃₁ F ₂ N ₃ O ₂	455.24	456
956		C ₂₃ H ₃₁ N ₃ O ₂	381.24	382
957		C ₂₄ H ₃₃ N ₃ O ₂	395.26	396
958		C ₂₄ H ₃₃ N ₃ O ₂	395.26	396
959		C ₂₆ H ₂₉ N ₃ O ₂	415.23	416
960		C ₂₅ H ₂₉ N ₅ O ₂	431.23	432
961		C ₂₄ H ₂₄ ClFN ₄ O ₃	470.15	471
962		C ₂₇ H ₃₆ FN ₃ O ₂	453.61	454
963		C ₂₄ H ₃₀ N ₄ O ₂	406.24	407

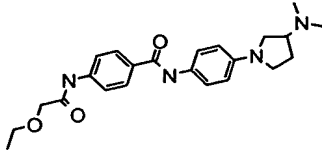
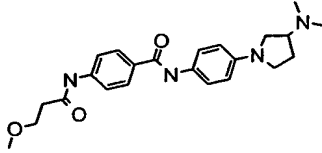
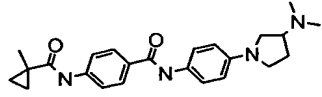
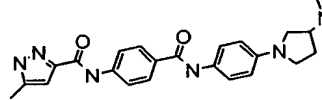
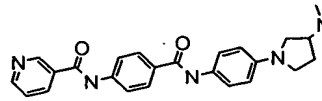
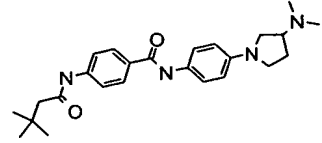
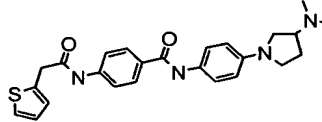
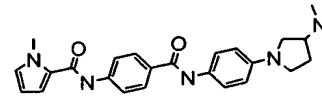
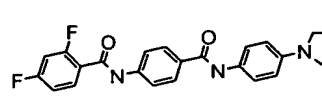
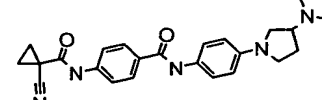
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
964		C ₂₄ H ₂₈ N ₄ O ₂	404.22	405
965		C ₂₇ H ₂₉ N ₅ O	439.24	440
966		C ₂₅ H ₂₈ N ₄ O ₄ S	480.18	481
967		C ₂₄ H ₂₆ N ₄ O ₂	402.21	403
968		C ₂₇ H ₂₇ BrN ₄ O ₂	518.13	519
969		C ₂₂ H ₂₄ ClN ₅ O	409.17	410
970		C ₂₂ H ₂₃ F ₂ N ₃ O ₃	415.17	416
971		C ₂₁ H ₂₃ N ₅ OS	393.16	394
972		C ₂₃ H ₂₄ ClN ₃ OS	425.13	426
973		C ₂₂ H ₂₄ N ₄ O ₃	392.18	393

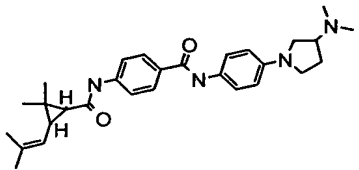
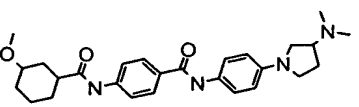
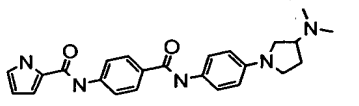
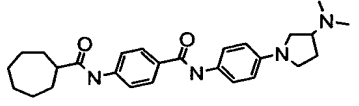
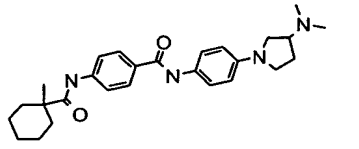
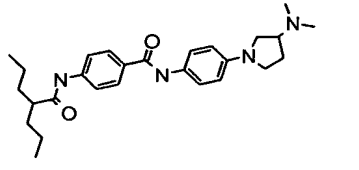
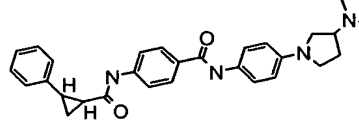
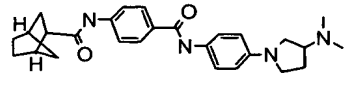
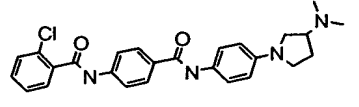
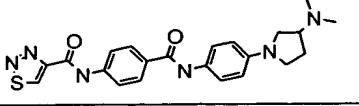
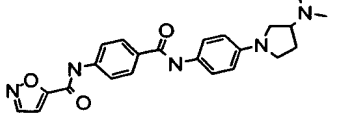
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
974		C ₂₅ H ₂₇ ClN ₄ O ₂	450.18	451
975		C ₂₅ H ₃₀ N ₄ O	402.24	403
976		C ₂₂ H ₂₅ N ₅ O	375.21	376
977		C ₂₂ H ₂₇ N ₃ O ₃ S	413.18	414
978		C ₂₀ H ₂₃ F ₃ N ₄ OS	424.15	425
979		C ₂₁ H ₂₄ F ₃ N ₃ OS	423.16	424
980		C ₂₆ H ₂₄ BrF ₃ N ₆ O	572.11	573
981		C ₂₃ H ₂₅ ClN ₄ OS	440.14	441
982		C ₂₄ H ₃₂ N ₄ O ₃ S	456.22	457
983		C ₂₄ H ₃₁ ClN ₄ O ₃ S	490.18	491
984		C ₂₃ H ₂₅ N ₃ O ₄ S	439.16	440

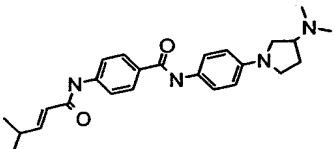
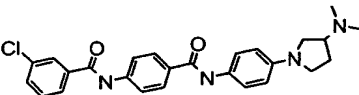
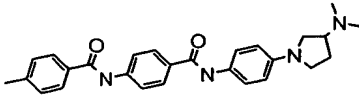
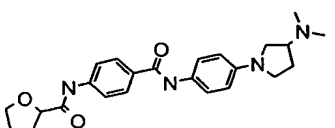
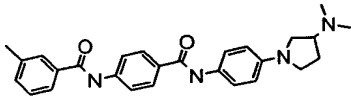
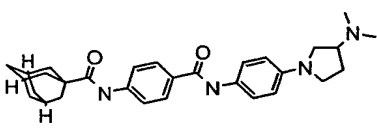
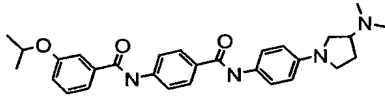
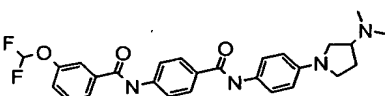
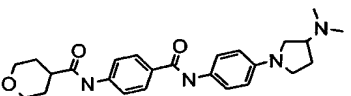
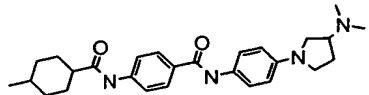
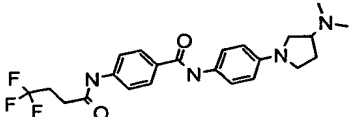
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
985		C ₂₆ H ₃₂ N ₄ O ₃	448.25	449
986		C ₂₆ H ₃₂ N ₄ O	416.26	417
987		C ₂₂ H ₂₇ N ₃ OS	381.19	382
988		C ₂₄ H ₃₁ N ₃ O ₂	393.24	394
989		C ₂₂ H ₂₄ F ₃ N ₃ OS	435.16	436
990		C ₂₄ H ₃₃ N ₃ O	379.26	380
991		C ₂₂ H ₂₉ N ₃ O ₂	367.23	368
992		C ₂₅ H ₃₅ N ₃ O	393.28	394
993		C ₂₅ H ₃₀ N ₄ O	402.24	403
994		C ₂₂ H ₂₆ N ₄ OS ₂	426.15	427
995		C ₂₉ H ₃₂ N ₄ O ₂	468.25	469
996		C ₂₃ H ₂₆ N ₅ O	407.21	408

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
997		C ₂₈ H ₂₈ ClN ₅ O	485.20	486
998		C ₂₀ H ₂₃ N ₅ O ₂ S	397.16	398
999		C ₂₅ H ₂₆ N ₆ O	426.22	427
1000		C ₂₂ H ₂₄ N ₄ O ₂	376.19	377
1001		C ₂₆ H ₃₅ FN ₄ O ₂	454.27	455
1002		C ₂₅ H ₃₄ FN ₃ O ₂	427.57	428
1003		C ₂₄ H ₂₅ FN ₄ O	404.20	405
1004		C ₂₅ H ₃₀ N ₄ O ₂	418.24	419
1005		C ₂₆ H ₃₁ FN ₄ O ₂	450.24	451
1006		C ₂₅ H ₃₄ N ₄ O ₂	422.27	423

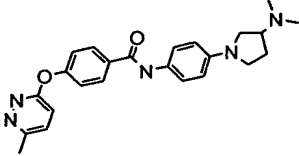
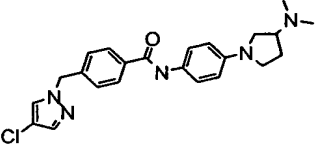
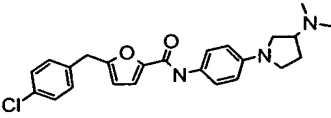
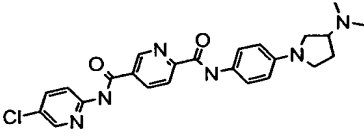
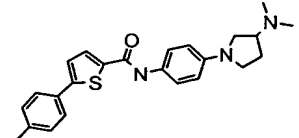
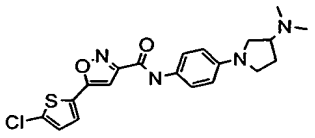
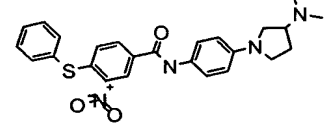
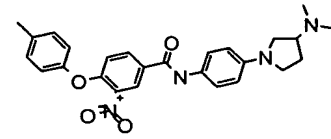
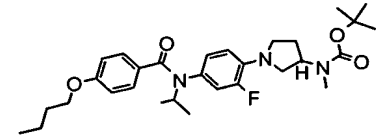
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1007		C ₂₄ H ₃₀ N ₄ O ₂	406.24	407
1008		C ₂₇ H ₃₀ N ₄ O ₂	442.24	443
1009		C ₂₇ H ₂₉ FN ₄ O ₂	460.23	461
1010		C ₂₆ H ₃₄ N ₄ O ₂	434.27	435
1011		C ₂₆ H ₂₆ ClFN ₄ O ₂	480.17	481
1012		C ₂₆ H ₂₇ FN ₄ O ₂	446.21	447
1013		C ₂₅ H ₂₇ N ₅ O ₂	429.22	430
1014		C ₂₇ H ₃₆ N ₄ O ₂	448.28	449
1015		C ₂₅ H ₂₉ N ₅ O ₃	447.23	448
1016		C ₂₉ H ₃₂ N ₄ O ₂	468.25	469
1017		C ₂₆ H ₂₇ FN ₄ O ₂	446.21	447

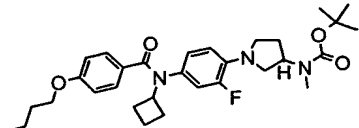
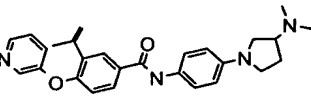
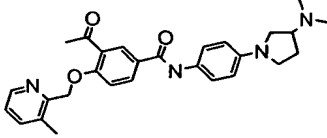
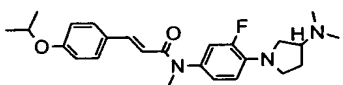
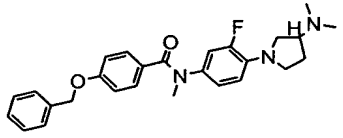
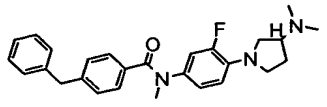
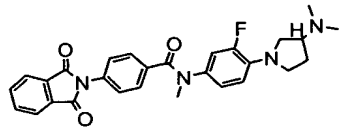
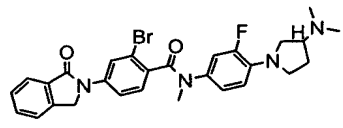
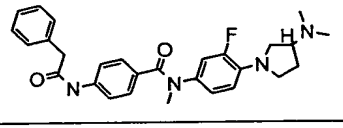
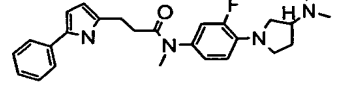
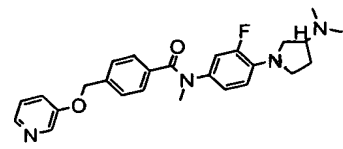
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1018		C ₂₃ H ₃₀ N ₄ O ₃	410.23	411
1019		C ₂₃ H ₃₀ N ₄ O ₃	410.23	411
1020		C ₂₄ H ₃₀ N ₄ O ₂	406.24	407
1021		C ₂₄ H ₂₈ N ₆ O ₂	432.23	433
1022		C ₂₅ H ₂₇ N ₅ O ₂	429.22	430
1023		C ₂₅ H ₃₄ N ₄ O ₂	422.27	423
1024		C ₂₅ H ₂₈ N ₄ O ₂ S	448.19	449
1025		C ₂₅ H ₂₉ N ₅ O ₂	431.23	432
1026		C ₂₆ H ₂₆ F ₂ N ₄ O ₂	464.20	465
1027		C ₂₄ H ₂₇ N ₅ O ₂	417.22	418

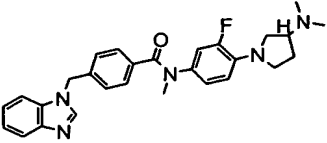
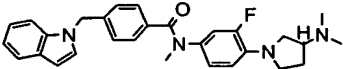
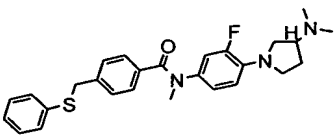
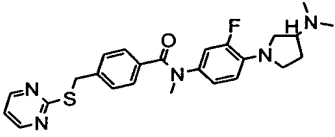
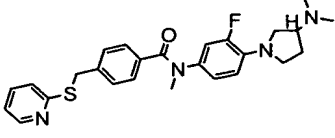
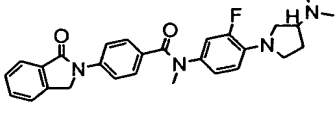
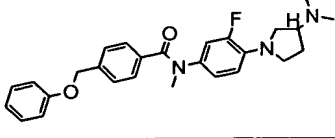
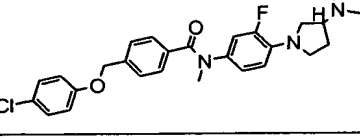
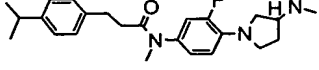
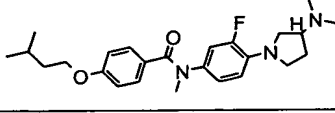
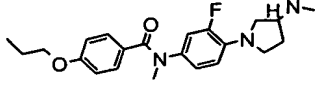
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1028		C ₂₉ H ₃₈ N ₄ O ₂	474.30	475
1029		C ₂₇ H ₃₆ N ₄ O ₃	464.28	465
1030		C ₂₄ H ₂₇ N ₅ O ₂	417.22	418
1031		C ₂₇ H ₃₆ N ₄ O ₂	448.28	449
1032		C ₂₇ H ₃₆ N ₄ O ₂	448.28	449
1033		C ₂₇ H ₃₈ N ₄ O ₂	450.30	451
1034		C ₂₉ H ₃₂ N ₄ O ₂	468.25	469
1035		C ₂₇ H ₃₄ N ₄ O ₂	446.27	447
1036		C ₂₆ H ₂₇ ClN ₄ O ₂	462.18	463
1037		C ₂₂ H ₂₄ N ₆ O ₂ S	436.17	437
1038		C ₂₃ H ₂₅ N ₅ O ₃	419.20	420

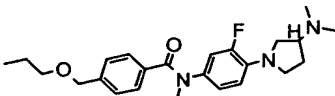


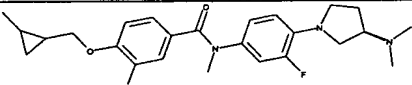
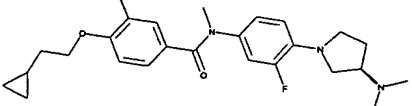
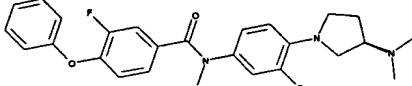
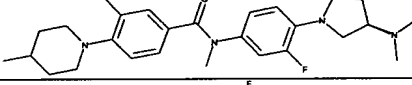
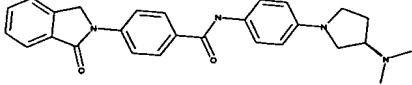
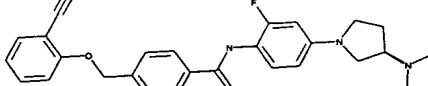
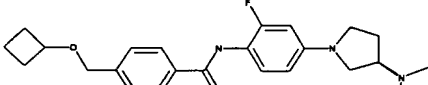
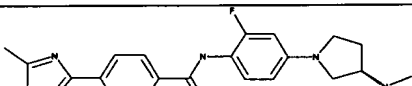
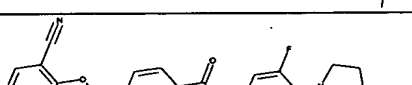
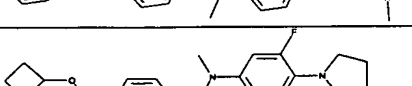
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1039		C ₂₅ H ₃₂ N ₄ O ₂	420.25	421
1040		C ₂₆ H ₂₇ ClN ₄ O ₂	462.18	463
1041		C ₂₇ H ₃₀ N ₄ O ₂	442.24	443
1042		C ₂₄ H ₃₀ N ₄ O ₃	422.23	423
1043		C ₂₇ H ₃₀ N ₄ O ₂	442.24	443
1044		C ₃₀ H ₃₈ N ₄ O ₂	486.30	487
1045		C ₂₉ H ₃₄ N ₄ O ₃	486.26	487
1046		C ₂₇ H ₂₈ F ₂ N ₄ O ₃	494.21	495
1047		C ₂₅ H ₃₂ N ₄ O ₃	436.25	437
1048		C ₂₇ H ₃₆ N ₄ O ₂	448.28	449
1049		C ₂₃ H ₂₇ F ₃ N ₄ O ₂	448.21	449

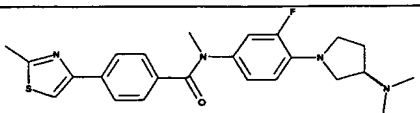
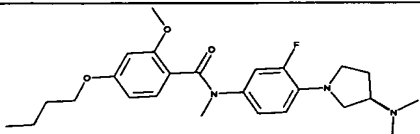
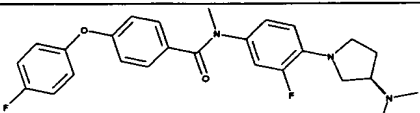
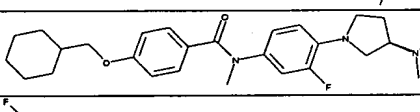
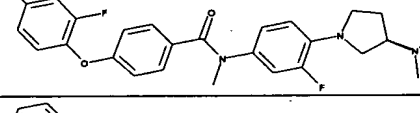
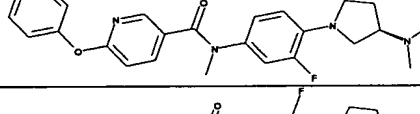
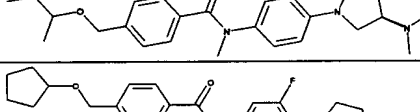
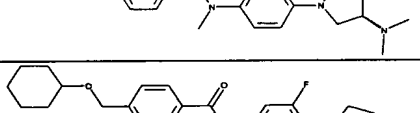
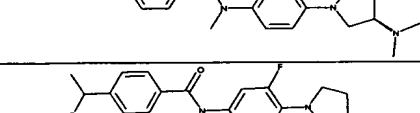
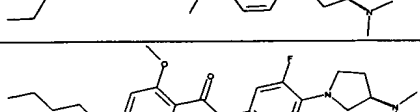

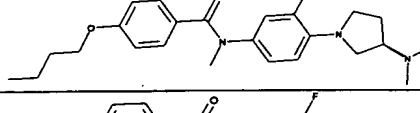
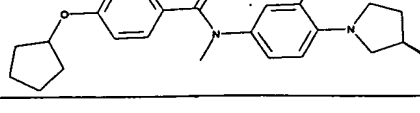
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1050		C ₂₆ H ₃₂ N ₄ O ₂	432.25	433
1051		C ₂₆ H ₃₆ N ₄ O ₂	436.28	437
1052		C ₂₂ H ₂₈ FN ₃ O ₂	385.22	386
1053		C ₂₇ H ₃₀ N ₄ O ₂	442.24	443
1054		C ₂₁ H ₂₄ N ₆ O	376.20	377
1055		C ₂₅ H ₂₇ N ₅ OS	445.19	446
1056		C ₂₄ H ₂₆ N ₄ O	386.21	387
1057		C ₂₂ H ₂₄ N ₄ O ₂	376.19	377
1058		C ₂₇ H ₃₀ N ₄ O	426.24	427
1059		C ₂₄ H ₃₂ N ₄ O	392.26	393
1060		C ₂₂ H ₂₆ N ₆ O	390.22	391

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1061		C ₂₄ H ₂₇ N ₅ O ₂	417.22	418
1062		C ₂₃ H ₂₆ ClN ₅ O	423.18	424
1063		C ₂₄ H ₂₆ ClN ₃ O ₂	423.17	424
1064		C ₂₄ H ₂₅ ClN ₆ O ₂	464.17	465
1065		C ₂₄ H ₂₇ N ₃ OS	405.19	406
1066		C ₂₀ H ₂₁ ClN ₄ O ₂ S	416.11	417
1067		C ₂₅ H ₂₆ N ₄ O ₃ S	462.17	463
1068		C ₂₆ H ₂₈ N ₄ O ₄	460.21	461
1069		C ₃₀ H ₄₂ FN ₃ O ₄	527.32	528

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1070		C ₃₁ H ₄₂ FN ₃ O ₄	539.32	540
1071		C ₂₇ H ₃₀ N ₄ O ₂	442.24	443
1072		C ₂₈ H ₃₂ N ₄ O ₃	472.25	473
1073		C ₂₅ H ₃₂ FN ₃ O ₂	425.25	426
1074		C ₂₇ H ₃₀ FN ₃ O ₂	447.23	448
1075		C ₂₇ H ₃₀ FN ₃ O	431.24	432
1076		C ₂₈ H ₂₇ FN ₄ O ₃	486.21	487
1077		C ₂₈ H ₂₈ BrFN ₄ O ₂	550.14	551
1078		C ₂₈ H ₃₁ FN ₄ O ₂	474.24	475
1079		C ₂₆ H ₃₁ FN ₄ O	434.25	435
1080		C ₂₆ H ₂₉ FN ₄ O ₂	448.23	449

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1081		C ₂₈ H ₃₀ FN ₅ O	471.24	472
1082		C ₂₉ H ₃₁ FN ₄ O	470.25	471
1083		C ₂₇ H ₃₀ FN ₃ OS	463.21	464
1084		C ₂₅ H ₂₈ FN ₅ OS	465.20	466
1085		C ₂₆ H ₂₉ FN ₄ OS	464.20	465
1086		C ₂₈ H ₂₉ FN ₄ O ₂	472.23	473
1087		C ₂₇ H ₃₀ FN ₃ O ₂	447.23	448
1088		C ₂₇ H ₂₉ ClFN ₃ O ₂	481.19	482
1089		C ₂₅ H ₃₄ FN ₃ O	411.27	412
1090		C ₂₅ H ₃₄ FN ₃ O ₂	427.26	428
1091		C ₂₃ H ₃₀ FN ₃ O ₂	399.23	400

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1092		C ₂₄ H ₃₂ FN ₃ O ₂	413.25	414
1093		C ₂₆ H ₃₂ FN ₃ O ₂	437.25	438
1094		C ₃₀ H ₃₆ N ₄ O ₄	516.27	517
1095		C ₂₅ H ₃₁ F ₂ N ₃ O ₂	443.24	444
1096		C ₂₅ H ₃₁ F ₂ N ₃ O ₂	443.24	444
1097		C ₂₆ H ₂₇ F ₂ N ₃ O ₂	451.21	452
1098		C ₂₆ H ₃₄ F ₂ N ₄ O	456.27	457
1099		C ₂₇ H ₂₇ FN ₄ O ₂	458.21	459
1100		C ₂₇ H ₂₇ FN ₄ O ₂	458.21	459
1101		C ₂₄ H ₃₀ FN ₃ O ₂	411.23	412
1102		C ₂₃ H ₂₅ FN ₄ OS	424.17	425
1103		C ₂₈ H ₂₉ FN ₄ O ₂	472.23	473
1104		C ₂₅ H ₃₂ FN ₃ O ₂	425.25	426

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1105		C ₂₄ H ₂₇ FN ₄ OS	438.19	439
1106		C ₂₅ H ₃₄ FN ₃ O ₃	443.26	444
1107		C ₂₆ H ₂₇ F ₂ N ₃ O ₂	451.21	452
1108		C ₂₇ H ₃₆ FN ₃ O ₂	453.28	454
1109		C ₂₆ H ₂₆ F ₃ N ₃ O ₂	469.20	470
1110		C ₂₅ H ₂₇ FN ₄ O ₂	434.21	435
1111		C ₂₅ H ₃₄ FN ₃ O ₂	427.26	428
1112		C ₂₆ H ₃₄ FN ₃ O ₂	439.26	440
1113		C ₂₇ H ₃₆ FN ₃ O ₂	453.28	454
1114		C ₂₅ H ₃₄ FN ₃ O ₂	427.26	428
1115		C ₂₅ H ₃₃ ClFN ₃ O ₃	477.22	478
1116		C ₂₄ H ₃₁ F ₂ N ₃ O ₂	431.24	432
1117		C ₂₅ H ₃₂ FN ₃ O ₂	425.25	426

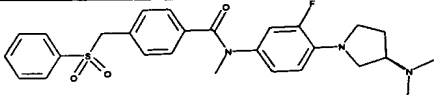
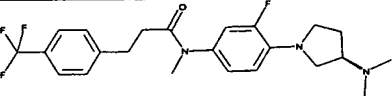
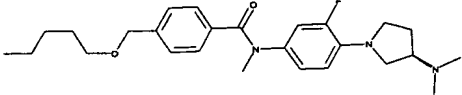
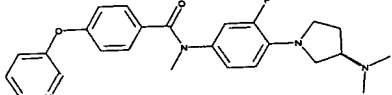
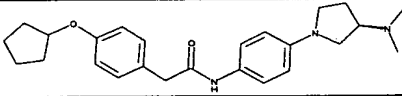
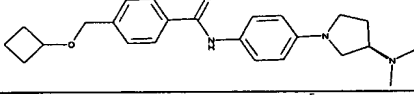
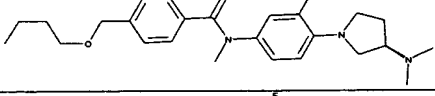
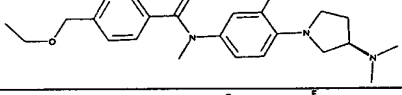
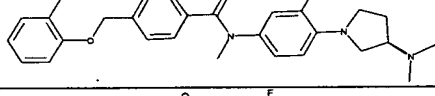
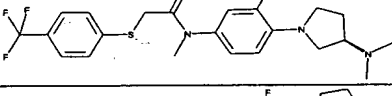
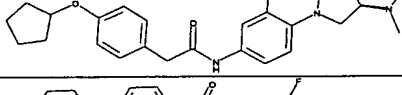
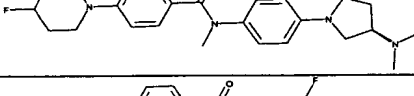
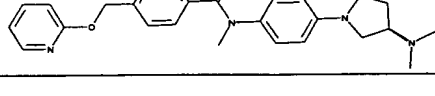
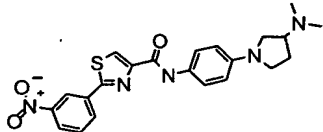
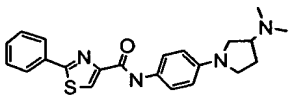
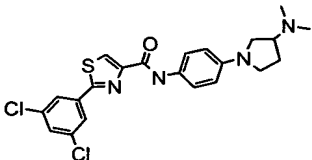
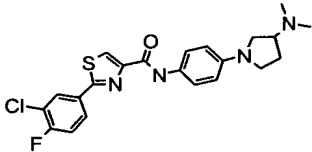
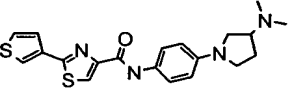
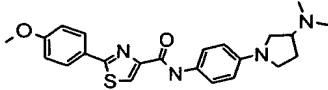
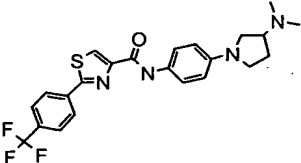
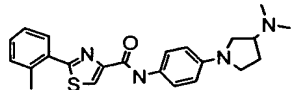
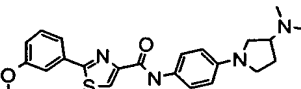
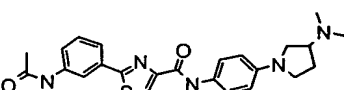
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1118		C ₂₇ H ₃₀ FN ₃ O ₃ S	495.62	496
1119		C ₂₃ H ₂₇ F ₄ N ₃ O	437.21	438
1120		C ₂₆ H ₃₆ FN ₃ O ₂	441.28	442
1121		C ₂₅ H ₂₇ FN ₄ O ₂	434.21	435
1122		C ₂₅ H ₃₃ N ₃ O ₂	407.26	408
1123		C ₂₄ H ₃₁ N ₃ O ₂	393.24	394
1124		C ₂₅ H ₃₄ FN ₃ O ₂	427.26	428
1125		C ₂₃ H ₃₀ FN ₃ O ₂	399.23	400
1126		C ₂₇ H ₂₉ ClFN ₃ O ₂	481.19	482
1127		C ₂₂ H ₂₅ F ₄ N ₃ OS	455.17	456
1128		C ₂₅ H ₃₂ FN ₃ O ₂	425.25	426
1129		C ₂₅ H ₃₂ F ₂ N ₄ O	442.25	443
1130		C ₂₆ H ₂₉ FN ₄ O ₂	448.23	449

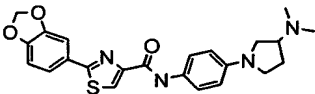
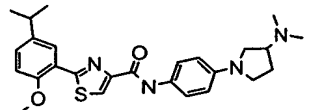
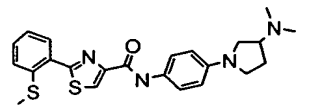
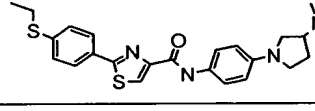
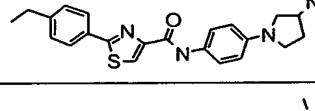
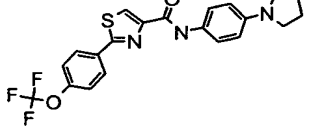
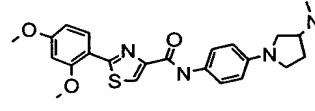
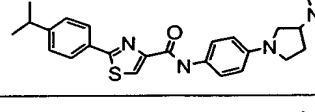
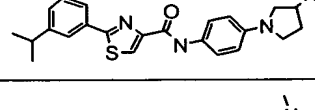
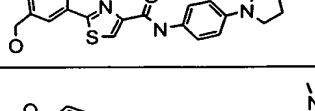
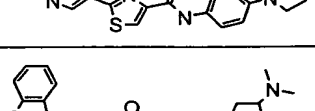
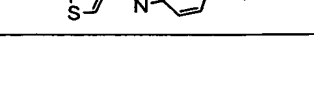
Table 8

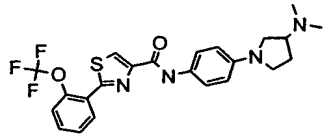
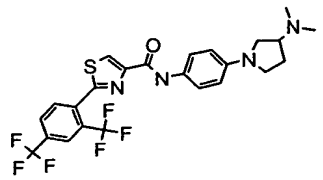
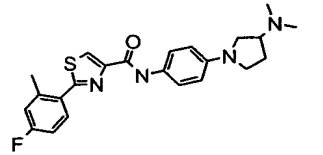
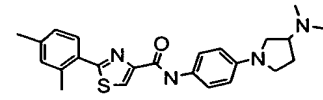
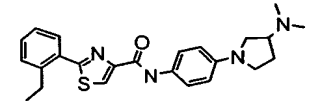
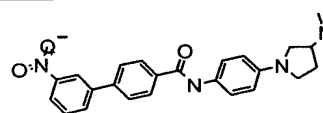
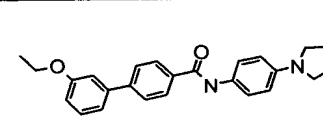
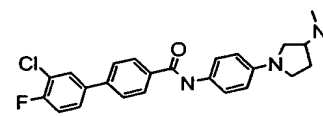
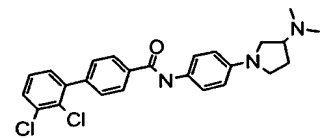
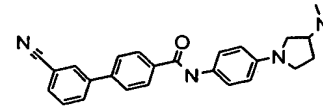
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1131		C ₂₃ H ₂₃ Cl ₂ N ₃ O ₂	443.12	444
1132		C ₂₃ H ₂₃ ClFN ₃ O ₂	427.15	428
1133		C ₂₄ H ₂₆ FN ₃ O ₂	407.20	408
1134		C ₂₈ H ₃₃ N ₃ O ₄	475.25	476
1135		C ₂₉ H ₃₄ N ₄ O ₅	518.25	519
1136		C ₃₃ H ₄₁ N ₃ O ₄	543.31	544
1137		C ₂₉ H ₃₆ N ₄ O ₄	504.27	505
1138		C ₂₉ H ₃₂ N ₄ O ₄	500.24	501
1139		C ₂₈ H ₃₀ F ₃ N ₃ O ₄	529.22	530

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1140		C ₂₂ H ₂₂ Cl ₂ N ₄ OS	460.09	461
1141		C ₂₂ H ₂₃ ClN ₄ OS	426.13	427
1142		C ₂₂ H ₂₃ FN ₄ OS	410.16	411
1143		C ₂₃ H ₂₅ FN ₄ OS	424.17	425
1144		C ₂₃ H ₂₂ ClF ₃ N ₄ OS	494.12	495
1145		C ₂₆ H ₂₆ N ₄ OS	442.18	443
1146		C ₂₅ H ₂₅ Cl ₂ N ₃ O	453.14	454
1147		C ₂₃ H ₂₅ N ₃ OS	391.17	392
1148		C ₂₃ H ₂₃ F ₃ N ₄ OS	460.15	461

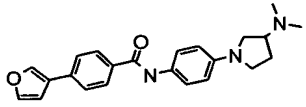
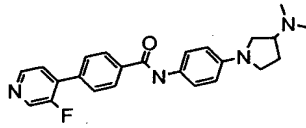
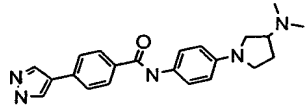
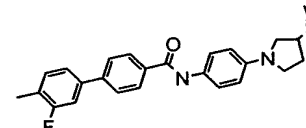
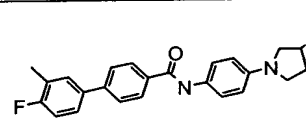
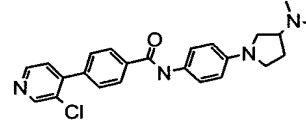
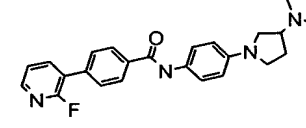
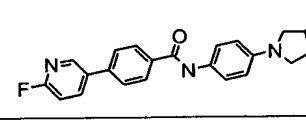
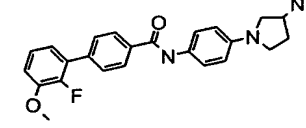
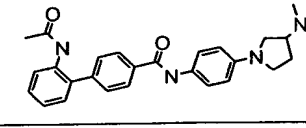
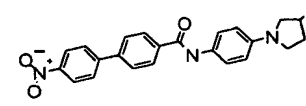
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1149		C ₂₂ H ₂₃ N ₅ O ₃ S	437.15	438
1150		C ₂₂ H ₂₄ N ₄ OS	392.17	393
1151		C ₂₂ H ₂₂ Cl ₂ N ₄ OS	460.09	461
1152		C ₂₂ H ₂₂ ClF ₂ N ₄ OS	444.12	445
1153		C ₂₀ H ₂₂ N ₄ OS ₂	398.12	399
1154		C ₂₃ H ₂₆ N ₄ O ₂ S	422.18	423
1155		C ₂₃ H ₂₃ F ₃ N ₄ OS	460.15	461
1156		C ₂₃ H ₂₆ N ₄ OS	406.18	407
1157		C ₂₃ H ₂₆ N ₄ O ₂ S	422.18	423
1158		C ₂₄ H ₂₇ N ₅ O ₂ S	449.19	450

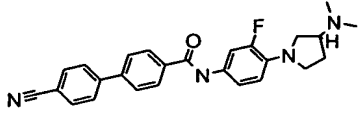
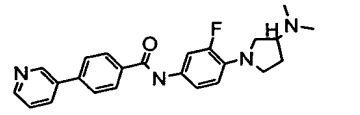
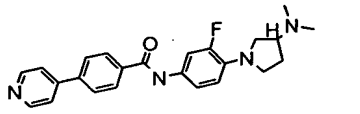
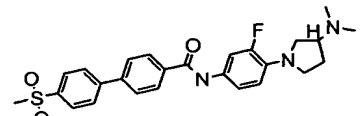
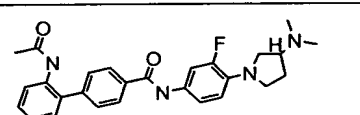
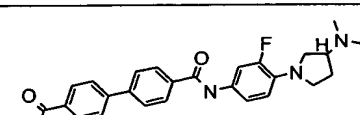
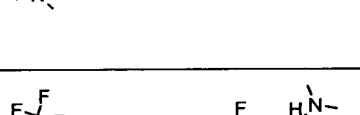
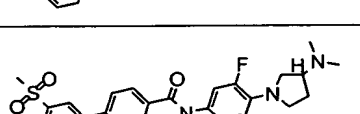
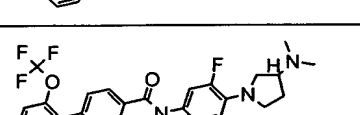
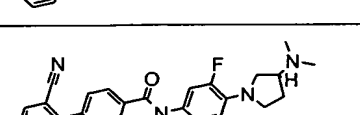
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1159		C ₂₂ H ₂₃ ClN ₄ OS	426.13	427
1160		C ₂₂ H ₂₃ FN ₄ OS	410.16	411
1161		C ₂₆ H ₂₆ N ₄ OS	442.18	443
1162		C ₂₃ H ₂₆ N ₄ OS ₂	438.15	439
1163		C ₂₂ H ₂₂ Cl ₂ N ₄ OS	460.09	461
1164		C ₂₄ H ₂₈ N ₄ O ₂ S	436.19	437
1165		C ₂₄ H ₂₈ N ₄ O ₂ S	436.19	437
1166		C ₂₆ H ₃₂ N ₄ OS	448.23	449
1167		C ₂₃ H ₂₃ N ₅ OS	417.16	418
1168		C ₂₈ H ₂₈ N ₄ OS	468.20	469
1169		C ₂₄ H ₂₈ N ₄ O ₂ S	436.19	437

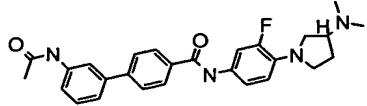
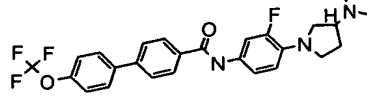
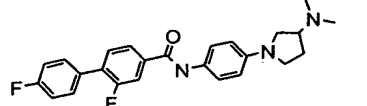
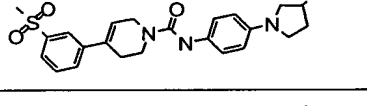
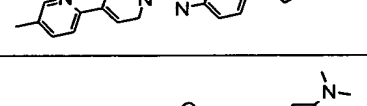
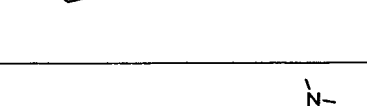
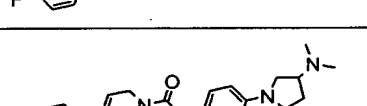
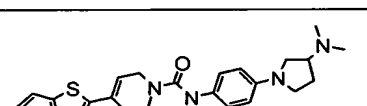
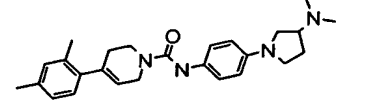

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1170		C ₂₃ H ₂₄ N ₄ O ₃ S	436.16	437
1171		C ₂₆ H ₃₂ N ₄ O ₂ S	464.23	465
1172		C ₂₃ H ₂₆ N ₄ OS ₂	438.15	439
1173		C ₂₄ H ₂₈ N ₄ OS ₂	452.17	453
1174		C ₂₄ H ₂₈ N ₄ OS	420.20	421
1175		C ₂₃ H ₂₃ F ₃ N ₄ O ₂ S	476.15	477
1176		C ₂₄ H ₂₈ N ₄ O ₃ S	452.19	453
1177		C ₂₅ H ₃₀ N ₄ OS	434.21	435
1178		C ₂₅ H ₃₀ N ₄ OS	434.21	435
1179		C ₂₃ H ₂₆ N ₄ O ₂ S	422.18	423
1180		C ₂₂ H ₂₅ N ₅ O ₂ S	423.17	424
1181		C ₂₄ H ₂₄ N ₄ OS ₂	448.14	449

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1182		C ₂₃ H ₂₃ F ₃ N ₄ O ₂ S	476.15	477
1183		C ₂₄ H ₂₂ F ₆ N ₄ OS	528.14	529
1184		C ₂₃ H ₂₅ FN ₄ OS	424.17	425
1185		C ₂₄ H ₂₈ N ₄ OS	420.20	421
1186		C ₂₄ H ₂₈ N ₄ OS	420.20	421
1187		C ₂₅ H ₂₆ N ₄ O ₃	430.20	431
1188		C ₂₇ H ₃₁ N ₃ O ₂	429.24	430
1189		C ₂₅ H ₂₅ ClFN ₃ O	437.17	438
1190		C ₂₅ H ₂₅ Cl ₂ N ₃ O	453.14	454
1191		C ₂₆ H ₂₆ N ₄ O	410.21	411

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1192		C ₂₇ H ₂₉ N ₃ O ₂	427.23	428
1193		C ₂₇ H ₂₉ N ₃ O ₂	427.23	428
1194		C ₂₅ H ₂₅ F ₂ N ₃ O	421.20	422
1195		C ₂₅ H ₂₅ F ₂ N ₃ O	421.20	422
1196		C ₂₆ H ₂₈ N ₄ O ₃	444.22	445
1197		C ₂₇ H ₃₂ N ₄ O	428.26	429
1198		C ₂₅ H ₂₈ N ₄ O ₂	416.22	417
1199		C ₂₇ H ₂₉ N ₃ O ₃	443.22	444
1200		C ₂₄ H ₂₈ N ₄ O ₂	404.22	405

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1201		C ₂₃ H ₂₅ N ₃ O ₂	375.20	376
1202		C ₂₄ H ₂₅ FN ₄ O	404.20	405
1203		C ₂₂ H ₂₅ N ₅ O	375.21	376
1204		C ₂₆ H ₂₈ FN ₃ O	417.22	418
1205		C ₂₆ H ₂₈ FN ₃ O	417.22	418
1206		C ₂₄ H ₂₅ ClN ₄ O	420.17	421
1207		C ₂₄ H ₂₅ FN ₄ O	404.20	405
1208		C ₂₄ H ₂₅ FN ₄ O	404.20	405
1209		C ₂₆ H ₂₈ FN ₃ O ₂	433.22	434
1210		C ₂₇ H ₃₀ N ₄ O ₂	442.24	443
1211		C ₂₅ H ₂₆ N ₄ O ₃	430.20	431

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1212		C ₂₆ H ₂₅ FN ₄ O	428.20	429
1213		C ₂₄ H ₂₅ FN ₄ O	404.20	405
1214		C ₂₄ H ₂₅ FN ₄ O	404.20	405
1215		C ₂₆ H ₂₈ FN ₃ O ₃ S	481.18	482
1216		C ₂₇ H ₂₉ FN ₄ O ₂	460.23	461
1217		C ₂₈ H ₃₁ FN ₄ O ₂	474.24	475
1218		C ₂₆ H ₂₅ F ₄ N ₃ O ₂	487.19	488
1219		C ₂₆ H ₂₈ FN ₃ O ₃ S	481.18	482
1220		C ₂₆ H ₂₅ F ₄ N ₃ O ₂	487.19	488
1221		C ₂₆ H ₂₅ FN ₄ O	428.20	429

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1222		C ₂₇ H ₂₉ FN ₄ O ₂	460.23	461
1223		C ₂₆ H ₂₅ F ₄ N ₃ O ₂	487.19	488
1224		C ₂₅ H ₂₅ F ₂ N ₃ O	421.20	422
1225		C ₂₅ H ₃₂ N ₄ O ₃ S	468.22	469
1226		C ₂₄ H ₃₁ N ₅ O	405.25	406
1227		C ₂₄ H ₃₁ N ₅ O ₂	421.25	422
1228		C ₂₃ H ₂₈ FN ₅ O	409.23	410
1229		C ₂₆ H ₃₁ N ₅ O	429.25	430
1230		C ₂₅ H ₂₉ N ₅ OS	447.21	448
1231		C ₂₆ H ₃₄ N ₄ O	418.27	419

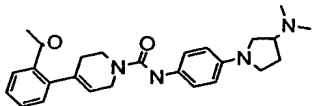
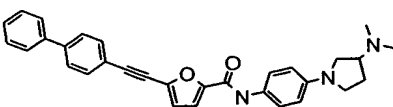
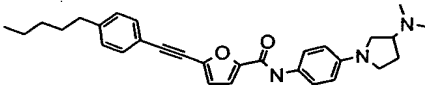
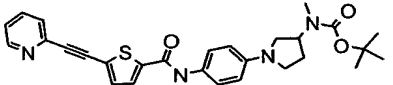
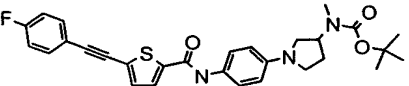
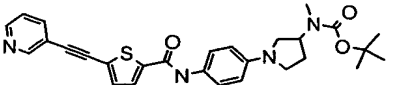
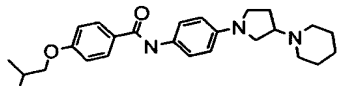
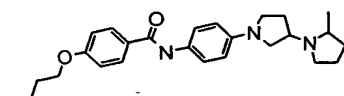
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1232		C ₂₆ H ₃₂ N ₄ O ₂	432.25	433

Table 9

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1233		C ₃₁ H ₂₉ N ₃ O ₂	475.23	476
1234		C ₃₀ H ₃₅ N ₃ O ₂	469.27	470
1235		C ₂₈ H ₃₀ N ₄ O ₃ S	502.20	503
1236		C ₂₉ H ₃₀ FN ₃ O ₃ S	519.20	520
1237		C ₂₈ H ₃₀ N ₄ O ₃ S	502.20	503

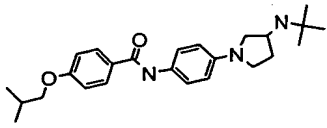
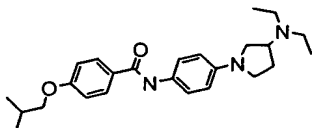
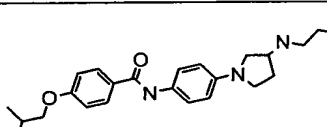
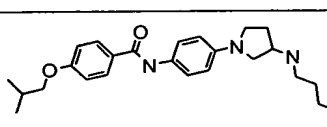
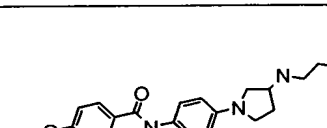
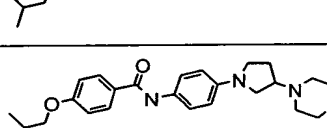
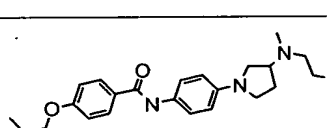
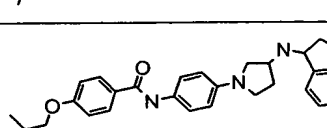
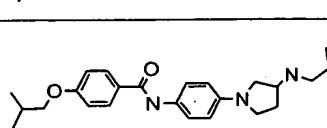
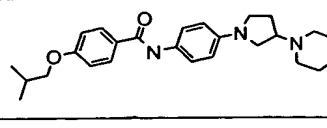
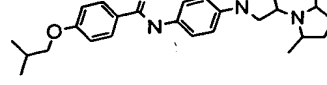
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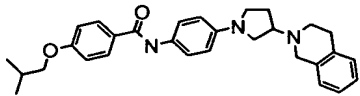
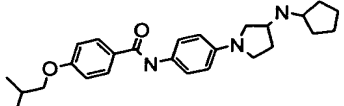
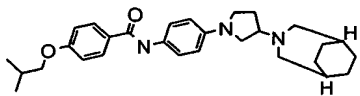
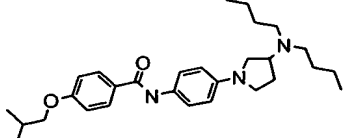
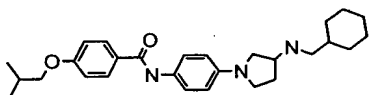
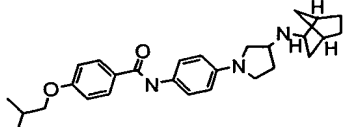
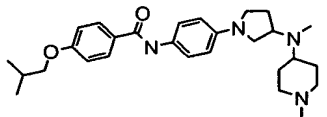
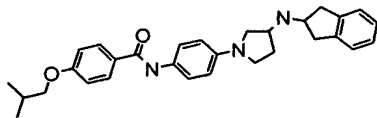
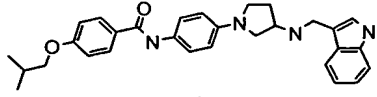
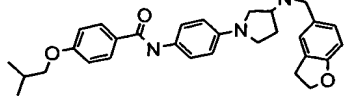
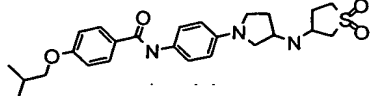
Table 10

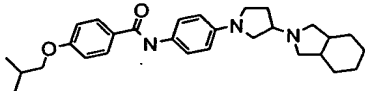
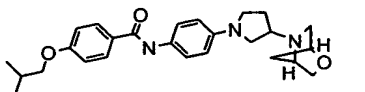
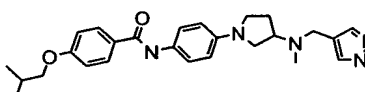
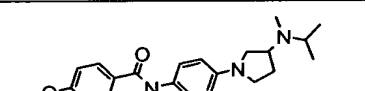
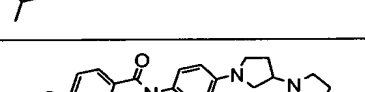
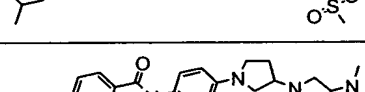
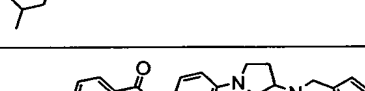
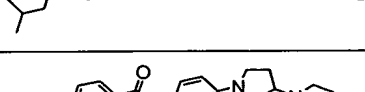

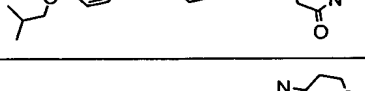
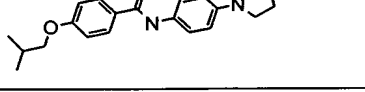
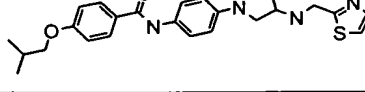
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1238		C ₂₆ H ₃₅ N ₃ O ₂	421.27	422
1239		C ₂₆ H ₃₅ N ₃ O ₂	421.27	422

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1240	 <chem>CCCCOc1ccc(cc1)C(=O)c2ccc(cc2)N3CCCN(C3)CC(F)(F)F</chem>	C ₂₅ H ₃₁ F ₂ N ₃ O ₂	443.24	444
1241	 <chem>CCCCOc1ccc(cc1)C(=O)c2ccc(cc2)N3CCCN(C3)C4C=CCC4</chem>	C ₂₇ H ₃₅ N ₃ O ₂	433.27	434
1242	 <chem>CCCCOc1ccc(cc1)C(=O)c2ccc(cc2)N3CCCN(C3)N4CCCCC4</chem>	C ₂₆ H ₃₅ N ₃ O ₂	421.27	422
1243	 <chem>CCCCOc1ccc(cc1)C(=O)c2ccc(cc2)N3CCCN(C3)CCN(C)C</chem>	C ₂₅ H ₃₆ N ₄ O ₂	424.28	425
1244	 <chem>CCCCOc1ccc(cc1)C(=O)c2ccc(cc2)N3CCCN(C3)CCOC</chem>	C ₂₄ H ₃₃ N ₃ O ₃	411.25	412
1245	 <chem>CCCCOc1ccc(cc1)C(=O)c2ccc(cc2)N3CCCN(C3)N(CC(C)C)C4CCCC4</chem>	C ₂₆ H ₃₇ N ₃ O ₃	439.28	440
1246	 <chem>CCCCOc1ccc(cc1)C(=O)c2ccc(cc2)N3CCCN(C3)N(C)C4CCCC4</chem>	C ₂₇ H ₃₇ N ₃ O ₂	435.29	436
1247	 <chem>CCCCOc1ccc(cc1)C(=O)c2ccc(cc2)N3CCCN(C3)C4CCCCC4</chem>	C ₂₇ H ₃₇ N ₃ O ₂	435.29	436
1248	 <chem>CCCCOc1ccc(cc1)C(=O)c2ccc(cc2)N3CCCN(C3)CNc4ccncn4</chem>	C ₂₇ H ₃₃ N ₅ O ₂	459.26	460
1249	 <chem>CCCCOc1ccc(cc1)C(=O)c2ccc(cc2)N3CCCN(C3)N4CCOCC4</chem>	C ₂₆ H ₃₅ N ₃ O ₃	437.27	438
1250	 <chem>CCCCOc1ccc(cc1)C(=O)c2ccc(cc2)N3CCCN(C3)CCc4ccc(F)cc4</chem>	C ₂₉ H ₃₄ FN ₃ O ₂	475.26	476

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1251		C ₂₇ H ₃₂ N ₄ O ₂	444.25	445
1252		C ₂₄ H ₃₃ N ₃ O ₂	395.26	396
1253		C ₂₃ H ₃₁ N ₃ O ₂	381.24	382
1254		C ₂₅ H ₃₃ N ₃ O ₃	423.25	424
1255		C ₂₃ H ₂₈ F ₃ N ₃ O ₂	435.21	436
1256		C ₂₃ H ₃₀ FN ₃ O ₂	399.23	400
1257		C ₂₇ H ₃₇ N ₃ O ₃	451.28	452
1258		C ₂₄ H ₃₃ N ₃ O ₃	411.25	412
1259		C ₂₅ H ₃₃ N ₃ O ₂	407.26	408
1260		C ₂₅ H ₃₃ N ₃ O ₂	407.26	408
1261		C ₂₅ H ₃₅ N ₃ O ₂	409.27	410

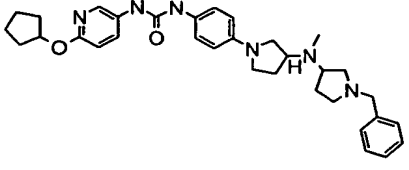
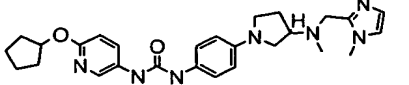
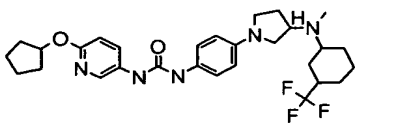
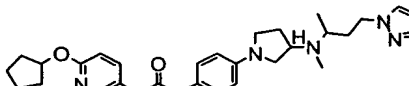
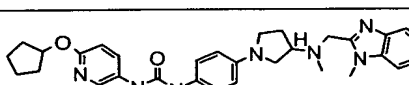
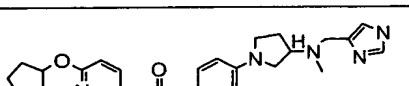
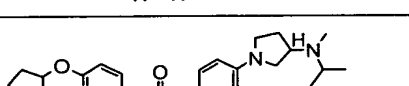
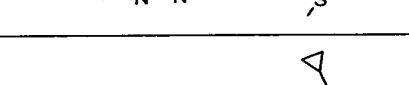
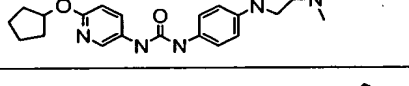
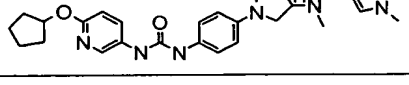
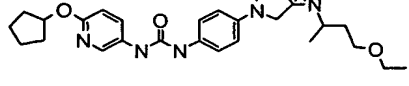
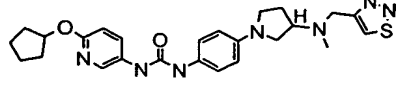
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1262		C ₂₅ H ₃₅ N ₃ O ₂	409.27	410
1263		C ₂₅ H ₃₅ N ₃ O ₂	409.27	410
1264		C ₂₅ H ₃₅ N ₃ O ₂	409.27	410
1265		C ₂₇ H ₃₅ N ₅ O ₂	461.28	462
1266		C ₂₈ H ₃₈ N ₄ O ₃	478.29	479
1267		C ₂₆ H ₃₆ N ₄ O ₂	436.28	437
1268		C ₂₆ H ₃₈ N ₄ O ₂	438.30	439
1269		C ₃₀ H ₃₅ N ₃ O ₂	469.27	470
1270		C ₂₇ H ₃₂ N ₄ O ₂	444.25	445
1271		C ₂₇ H ₃₆ N ₄ O ₃	464.28	465
1272		C ₂₇ H ₃₇ N ₃ O ₂	435.29	436

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1273		C30H35N3O2	469.27	470
1274		C26H35N3O2	421.27	422
1275		C29H39N3O2	461.30	462
1276		C29H43N3O2	465.34	466
1277		C28H39N3O2	449.30	450
1278		C28H37N3O2	447.29	448
1279		C28H40N4O2	464.32	465
1280		C30H35N3O2	469.27	470
1281		C30H34N4O2	482.27	483
1282		C30H35N3O3	485.27	486
1283		C25H33N3O4S	471.22	472

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1284		C ₂₉ H ₃₉ N ₃ O ₂	461.30	462
1285		C ₂₆ H ₃₃ N ₃ O ₃	435.25	436
1286		C ₂₇ H ₃₅ N ₅ O ₂	461.28	462
1287		C ₂₅ H ₃₅ N ₃ O ₂	409.27	410
1288		C ₂₆ H ₃₅ N ₃ O ₄ S	485.23	486
1289		C ₂₇ H ₃₈ N ₄ O ₂	450.30	451
1290		C ₂₆ H ₃₁ N ₃ O ₂ S	449.21	450
1291		C ₂₉ H ₄₁ N ₃ O ₂	463.32	464
1292		C ₂₅ H ₃₂ N ₄ O ₃	436.25	437
1293		C ₂₆ H ₃₅ N ₃ O ₃	437.27	438
1294		C ₂₅ H ₃₀ N ₄ O ₂ S	450.21	451
1295		C ₂₄ H ₃₁ N ₃ O ₂	393.24	394

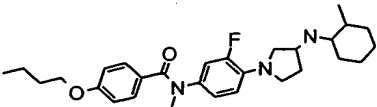
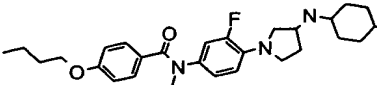
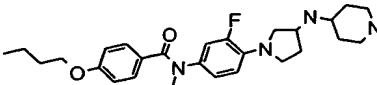
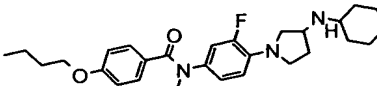
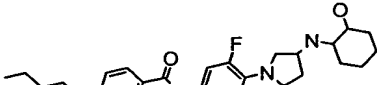
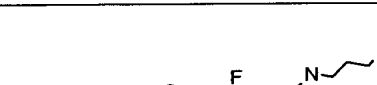
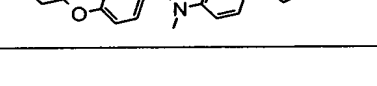
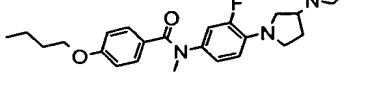
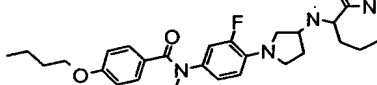
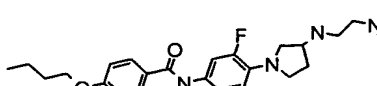
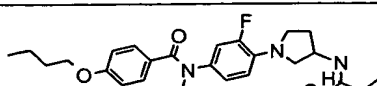
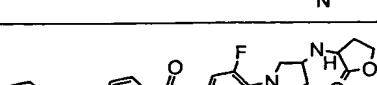
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1296		C ₂₅ H ₃₅ N ₅ O ₂	437.28	438
1297		C ₂₇ H ₃₇ N ₅ O ₂	463.30	464
1298		C ₂₆ H ₃₂ N ₆ O ₂ S	492.23	493
1299		C ₂₄ H ₃₃ N ₅ O ₃	439.26	440
1300		C ₂₈ H ₄₀ FN ₃ O ₃	485.30	486
1301		C ₂₇ H ₃₆ FN ₃ O ₂	453.28	454
1302		C ₃₁ H ₃₇ N ₅ O ₂	511.30	512
1303		C ₂₈ H ₃₉ N ₅ O ₂	477.31	478
1304		C ₂₇ H ₃₉ N ₅ O ₂	465.31	466
1305		C ₂₇ H ₃₉ N ₅ O ₂	465.31	466
1306		C ₂₆ H ₃₅ N ₅ O ₂ S	481.25	482
1307		C ₂₆ H ₃₃ N ₇ O ₂	475.27	476
1308		C ₂₆ H ₃₅ N ₅ O ₂	449.28	450

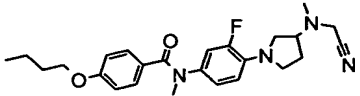
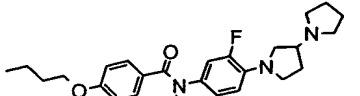
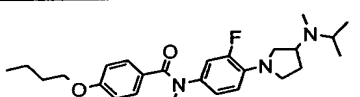
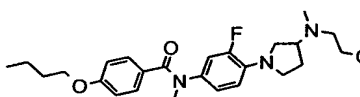
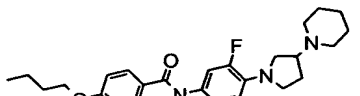
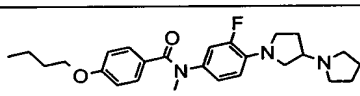
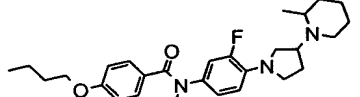
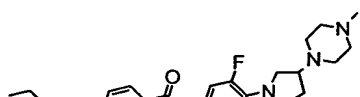
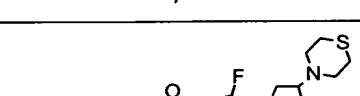
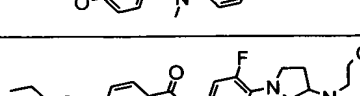
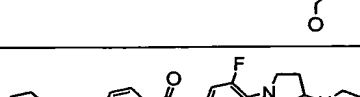
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1309		C ₂₆ H ₃₇ N ₅ O ₃	467.29	468
1310		C ₂₆ H ₃₇ N ₅ O ₃	467.29	468
1311		C ₂₆ H ₃₇ N ₅ O ₃	467.29	468
1312		C ₂₇ H ₃₇ N ₅ O ₃	479.29	480
1313		C ₂₇ H ₃₉ N ₅ O ₃	481.30	482
1314		C ₂₈ H ₃₈ N ₆ O ₂	490.31	491
1315		C ₂₈ H ₃₉ N ₅ O ₄	509.30	510
1316		C ₂₈ H ₃₉ N ₅ O ₂	477.31	478
1317		C ₂₉ H ₄₀ N ₆ O ₃	520.32	521
1318		C ₃₀ H ₄₄ N ₆ O ₂	520.35	521
1319		C ₃₀ H ₄₄ N ₆ O ₃	536.35	537
1320		C ₃₀ H ₃₄ N ₆ O ₂	510.27	511

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1321		C33H42N6O2	554.34	555
1322		C27H35N7O2	489.29	490
1323		C29H38F3N5O2	545.30	546
1324		C29H39N7O2	517.32	518
1325		C31H37N7O2	539.30	540
1326		C26H33N7O2	475.27	476
1327		C26H37N5O2S	483.27	484
1328		C26H35N5O2	449.28	450
1329		C27H35N7O2	489.29	490
1330		C28H41N5O3	495.32	496
1331		C25H31N7O2S	493.23	494
1332		C31H39N5O3	529.30	530

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1333		C30H42N6O4	550.33	551
1334		C28H41N5O2	479.33	480
1335		C29H30F2N4O2	504.58	505
1336		C25H32FN3O2	425.25	426
1337		C25H34FN3O2	427.26	428
1338		C24H32FN3O3	429.24	430
1339		C26H34FN3O2	439.26	440
1340		C26H34FN3O2	439.26	440
1341		C25H34FN3O3	443.26	444
1342		C25H34FN3O3	443.26	444
1343		C25H34FN3O3	443.26	444
1344		C27H36FN3O2	453.28	454

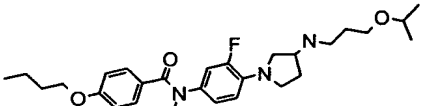
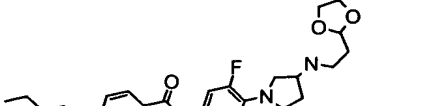
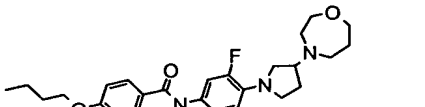
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1345		C ₂₇ H ₃₈ FN ₃ O ₂	455.30	456
1346		C ₂₇ H ₃₈ FN ₃ O ₂	455.30	456
1347		C ₂₇ H ₃₈ FN ₃ O ₂	455.30	456
1348		C ₂₆ H ₃₆ FN ₃ O ₃	457.27	458
1349		C ₂₆ H ₃₆ FN ₃ O ₃	457.27	458
1350		C ₂₅ H ₃₄ FN ₃ O ₄	459.25	460
1351		C ₂₅ H ₃₄ FN ₃ O ₄	459.25	460
1352		C ₂₈ H ₃₈ FN ₃ O ₂	467.30	468
1353		C ₂₇ H ₃₈ FN ₃ O ₃	471.29	472
1354		C ₂₇ H ₃₈ FN ₃ O ₃	471.29	472
1355		C ₂₇ H ₃₄ FN ₅ O ₂	479.27	480

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1356		C ₂₉ H ₄₀ FN ₃ O ₂	481.31	482
1357		C ₂₉ H ₄₀ FN ₃ O ₂	481.31	482
1358		C ₂₈ H ₃₉ FN ₄ O ₂	482.31	483
1359		C ₂₈ H ₃₈ FN ₃ O ₃	483.29	484
1360		C ₂₈ H ₃₈ FN ₃ O ₃	483.29	484
1361		C ₂₈ H ₃₆ FN ₅ O ₂	493.29	494
1362		C ₂₇ H ₃₅ FN ₆ O ₂	494.28	495
1363		C ₂₈ H ₃₇ FN ₄ O ₃	496.29	497
1364		C ₂₉ H ₄₁ FN ₄ O ₂	496.32	497
1365		C ₂₈ H ₃₉ FN ₄ O ₃	498.30	499
1366		C ₂₆ H ₃₂ FN ₃ O ₄	469.24	470
1367		C ₂₉ H ₄₀ FN ₃ O ₃	497.30	498

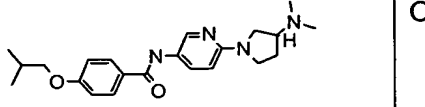
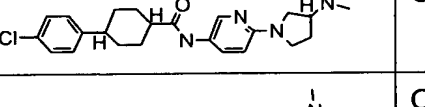
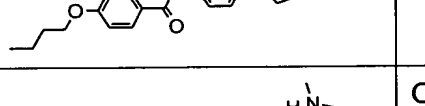
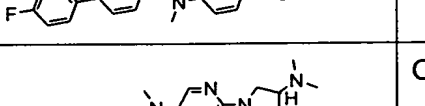
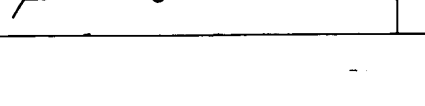
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1368		C ₂₅ H ₃₁ FN ₄ O ₂	438.24	439
1369		C ₂₆ H ₃₄ FN ₃ O ₂	439.26	440
1370		C ₂₆ H ₃₆ FN ₃ O ₂	441.28	442
1371		C ₂₅ H ₃₄ FN ₃ O ₃	443.26	444
1372		C ₂₇ H ₃₆ FN ₃ O ₂	453.28	454
1373		C ₂₆ H ₃₄ FN ₃ O ₃	455.26	456
1374		C ₂₈ H ₃₈ FN ₃ O ₂	467.30	468
1375		C ₂₇ H ₃₇ FN ₄ O ₂	468.29	469
1376		C ₂₆ H ₃₄ FN ₃ O ₂ S	471.24	472
1377		C ₂₆ H ₃₆ FN ₃ O ₄	473.27	474
1378		C ₂₈ H ₄₁ FN ₄ O ₂	484.32	485

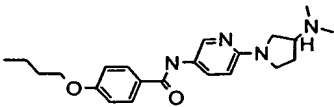
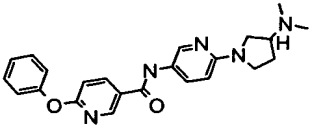
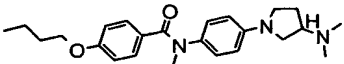
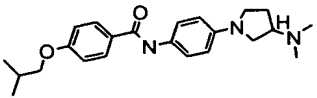
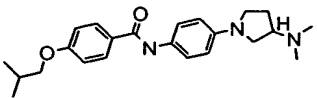
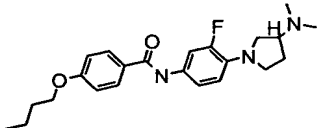
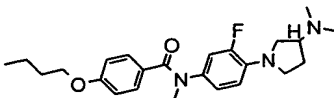
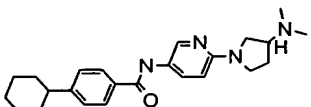
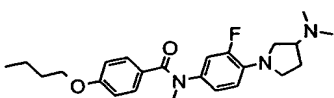
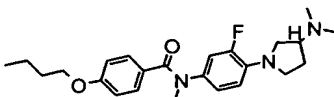
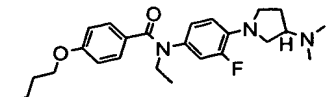
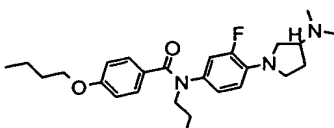
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1379		C28H37FN4O3	496.29	497
1380		C28H37FN4O3	496.29	497
1381		C32H38FN3O2	515.29	516
1382		C31H38FN3O3	519.29	520
1383		C31H43FN4O2	522.34	523
1384		C27H36FN3O3	469.27	470
1385		C27H36FN3O3	469.27	470
1386		C28H34F3N3O3	517.26	518
1387		C27H36FN3O4S	517.24	518
1388		C30H41FN4O3	524.32	525
1389		C27H36FN3O3	469.27	470

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1390		C ₂₂ H ₂₈ FN ₃ O ₂	385.22	386
1391		C ₂₉ H ₃₈ FN ₃ O ₄	511.29	512
1392		C ₂₆ H ₃₆ FN ₃ O ₃	457.27	458
1393		C ₂₅ H ₃₄ FN ₃ O ₃	443.26	444
1394		C ₂₇ H ₃₆ FN ₃ O ₃	469.27	470
1395		C ₂₆ H ₃₄ FN ₃ O ₃	455.26	456
1396		C ₂₈ H ₃₈ FN ₃ O ₃	483.29	484
1397		C ₂₆ H ₃₆ FN ₃ O ₃	457.27	458
1398		C ₂₆ H ₃₄ FN ₃ O ₄	471.25	472
1399		C ₂₈ H ₃₈ FN ₃ O ₄	499.29	500
1400		C ₂₇ H ₃₈ FN ₃ O ₃	471.29	472

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1401		C ₂₈ H ₄₀ FN ₃ O ₃	485.30	486
1402		C ₂₇ H ₃₆ FN ₃ O ₄	485.27	486
1403		C ₂₇ H ₃₆ FN ₃ O ₃	469.27	470

5 Table 11

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1404		C ₂₂ H ₃₀ N ₄ O ₂	382.24	383
1405		C ₂₄ H ₃₁ ClN ₄ O	426.22	427
1406		C ₂₃ H ₃₂ N ₄ O ₂	396.25	397
1407		C ₂₅ H ₂₇ FN ₄ O	418.22	419
1408		C ₂₃ H ₃₂ N ₄ O ₂	396.25	397

1409		C22H30N4O2	382.24	383
1410		C23H25N5O2	403.20	404
1411		C24H33N3O2	395.26	396
1412		C23H31N3O2 (S)- Konfiguration	381.24	382
1413		C23H31N3O2	381.24	382
1414		C23H30FN3O2	399.23	400
1415		C24H32FN3O2	413.25	414
1416		C24H32N4O	392.26	393
1417		C24H32FN3O2	413.25	414
1418		C24H32FN3O2 (S)-configuration	413.25	414
1419		C25H34FN3O2	427.26	428
1420		C26H36FN3O2	441.28	442

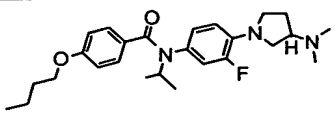
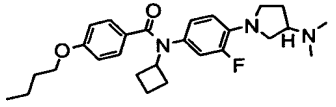
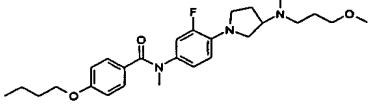
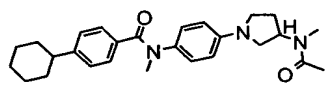
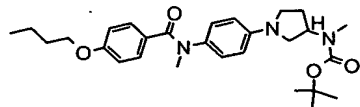
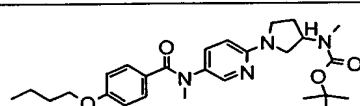
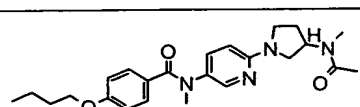
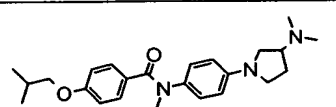
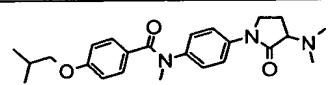
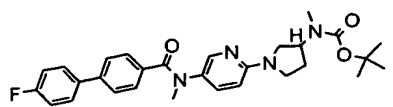
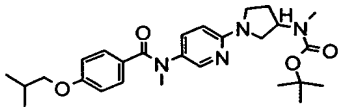
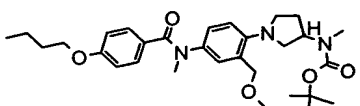
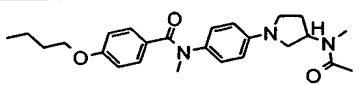
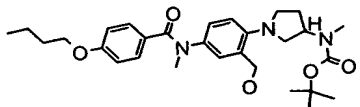
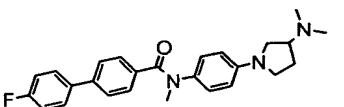
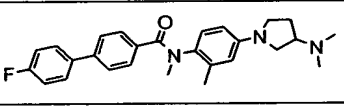
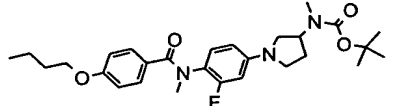
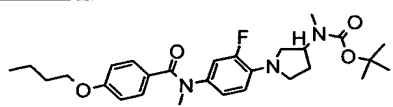
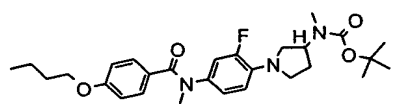
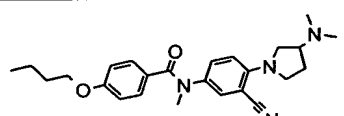
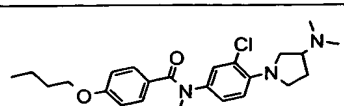
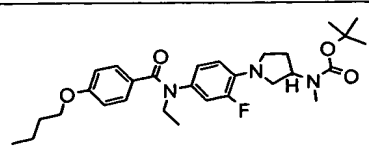
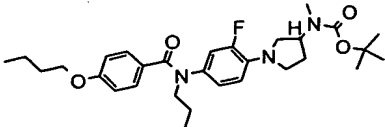
1421		C26H36FN3O2	441.28	442
1422		C27H36FN3O2	453.28	454
1423		C27H38FN3O3	471.29	472

Table 12

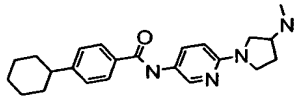
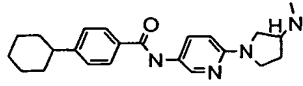
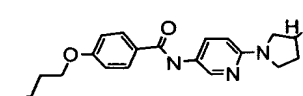
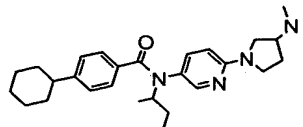
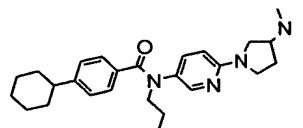
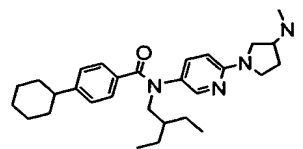
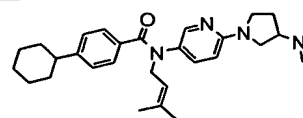
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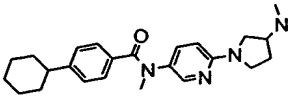
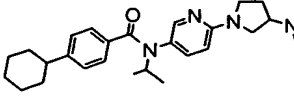
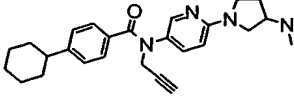
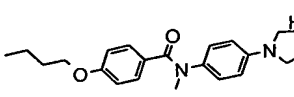
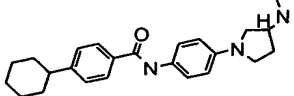
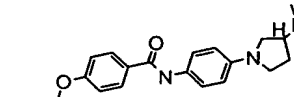
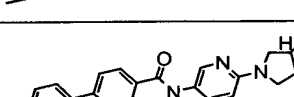
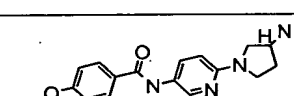
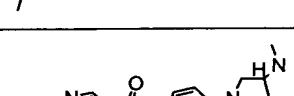
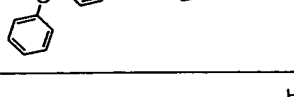
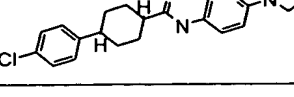
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1424		C27H35N3O2	433.27	434
1425		C28H39N3O4	481.29	482
1426		C27H38N4O4	482.29	483
1427		C24H32N4O3	424.25	425
1428		C24H33N3O2	395.26	396
1429		C24H31N3O3	409.24	410
1430		C29H33FN4O3	504.25	505

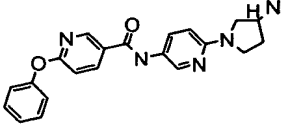
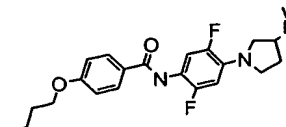
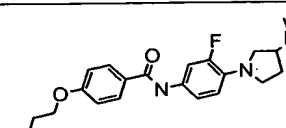
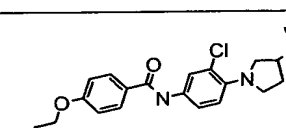
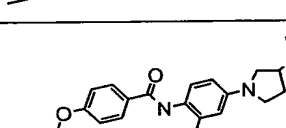
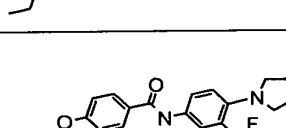
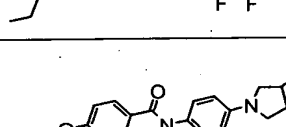
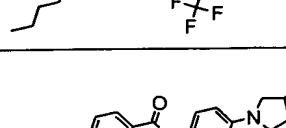
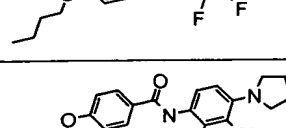
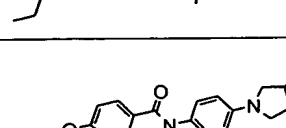
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
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1432		C ₃₀ H ₄₃ N ₃ O ₅	525.32	526
1433		C ₂₅ H ₃₃ N ₃ O ₃	423.25	424
1434		C ₂₉ H ₄₁ N ₃ O ₅	511.30	512
1435		C ₂₆ H ₂₈ FN ₃ O	417.22	418
1436		C ₂₇ H ₃₀ FN ₃ O	431.24	432
1437		C ₂₈ H ₃₈ FN ₃ O ₄	499.29	500
1438		C ₂₈ H ₃₈ FN ₃ O ₄	499.29	500
1439		C ₂₈ H ₃₈ FN ₃ O ₄ (S)- Konfiguration	499.29	500
1440		C ₂₅ H ₃₂ N ₄ O ₂	420.25	421
1441		C ₂₄ H ₃₂ ClN ₃ O ₂	429.22	430
1442		C ₂₉ H ₄₀ FN ₃ O ₄	513.30	514

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
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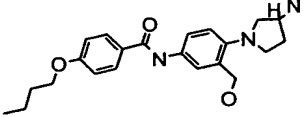
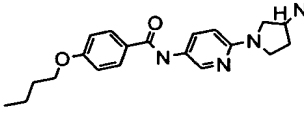
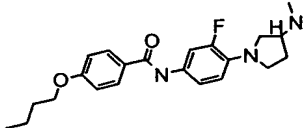
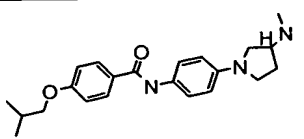
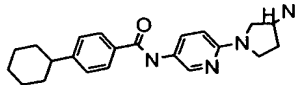
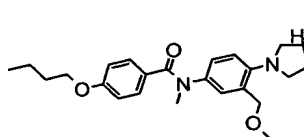
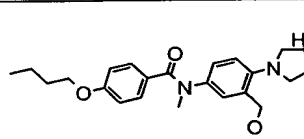
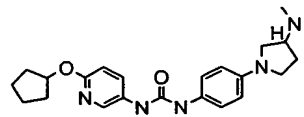
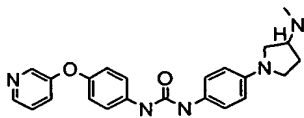
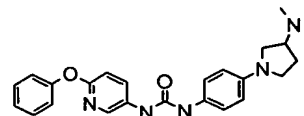
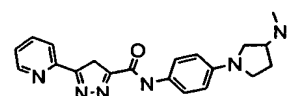
5 Table 13

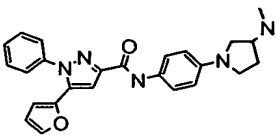
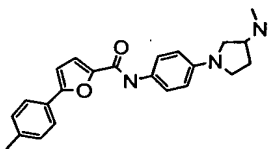
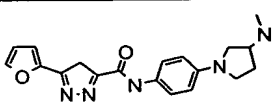
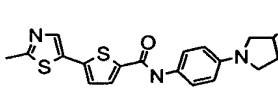
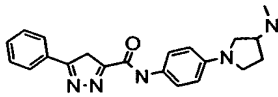
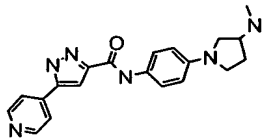
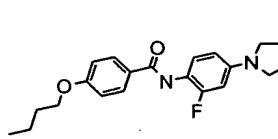
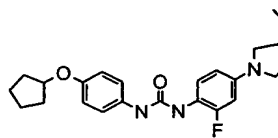
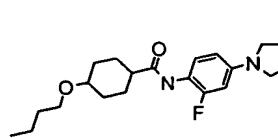
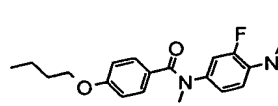
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1444		C ₂₃ H ₃₀ N ₄ O	378.24	379
1445		C ₂₃ H ₃₀ N ₄ O	378.24	379
1446		C ₂₁ H ₂₈ N ₄ O ₂	368.22	369
1447		C ₂₇ H ₃₈ N ₄ O	434.30	435
1448		C ₂₆ H ₃₆ N ₄ O	420.29	421
1449		C ₂₉ H ₄₂ N ₄ O	462.34	463
1450		C ₂₈ H ₃₈ N ₄ O	446.30	447

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1451		C ₂₄ H ₃₂ N ₄ O	392.26	393
1452		C ₂₆ H ₃₆ N ₄ O	420.29	421
1453		C ₂₆ H ₃₂ N ₄ O	416.26	417
1454		C ₂₃ H ₃₁ N ₃ O ₂	381.24	382
1455		C ₂₄ H ₃₁ N ₃ O	377.25	378
1456		C ₂₂ H ₂₉ N ₃ O ₂	367.23	368
1457		C ₂₂ H ₂₁ FN ₄ O	376.17	377
1458		C ₂₀ H ₂₆ N ₄ O ₂	354.21	355
1459		C ₂₃ H ₂₄ N ₄ O ₂	388.19	389
1460		C ₂₂ H ₂₇ ClN ₄ O	398.19	399
1461		C ₂₂ H ₃₀ N ₄ O ₂	382.24	383

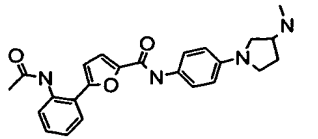
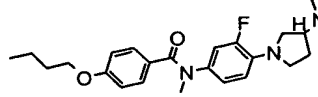
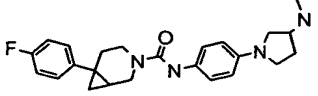
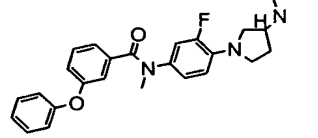
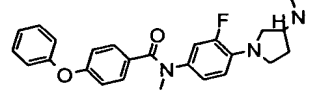
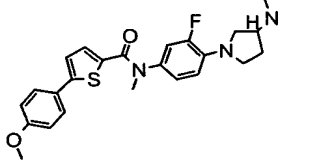
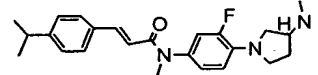
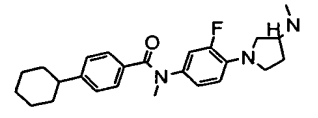
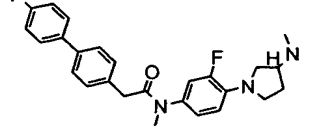
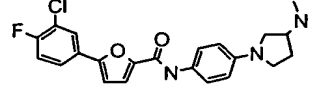
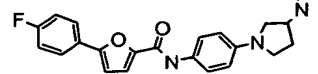
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1462		C ₂₁ H ₂₁ N ₅ O ₂	375.17	376
1463		C ₂₂ H ₂₇ F ₂ N ₃ O ₂	403.21	404
1464		C ₂₂ H ₂₈ FN ₃ O ₂	385.22	386
1465		C ₂₂ H ₂₈ ClN ₃ O ₂	401.19	402
1466		C ₂₃ H ₃₁ N ₃ O ₂	381.24	382
1467		C ₂₃ H ₂₈ F ₃ N ₃ O ₂	435.21	436
1468		C ₂₃ H ₂₈ F ₃ N ₃ O ₂	435.21	436
1469		C ₂₂ H ₂₇ F ₂ N ₃ O ₂	403.21	404
1470		C ₂₂ H ₂₇ ClFN ₃ O ₂	419.18	420
1471		C ₂₃ H ₂₈ N ₄ O ₂	392.22	393

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1472		C23H27ClN4O2	426.18	427
1473		C22H28BrN3O2	445.14	446
1474		C26H31N3O2	417.24	418
1475		C22H27F2N3O2	403.21	404
1476		C22H28BrN3O2	445.14	446
1477		C23H30ClN3O2	415.20	416
1478		C21H27ClN4O2	402.18	403
1479		C22H30N4O2	382.24	383
1480		C22H30N4O2	382.24	383
1481		C22H30N4O2	382.24	383
1482		C24H25FN4O	404.20	405

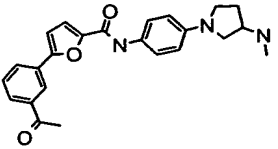
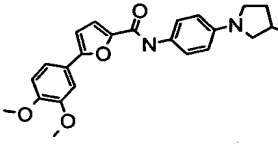
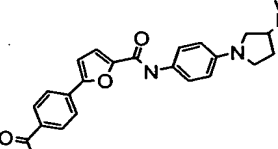
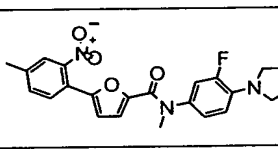
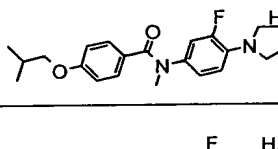
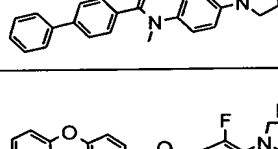
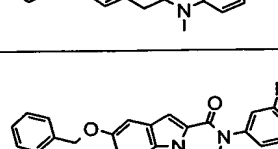
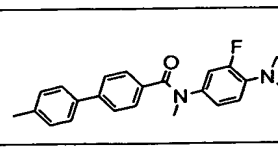
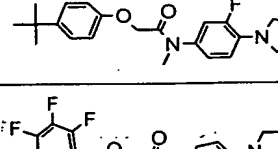
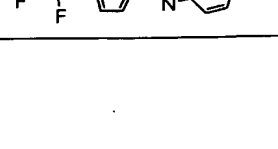

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1483		C ₂₂ H ₂₉ N ₃ O ₃	383.22	384
1484		C ₂₀ H ₂₆ N ₄ O ₂	354.21	355
1485		C ₂₂ H ₂₈ FN ₃ O ₂	385.22	386
1486		C ₂₂ H ₂₉ N ₃ O ₂	367.23	368
1487		C ₂₂ H ₂₈ N ₄ O	364.23	365
1488		C ₂₅ H ₃₅ N ₃ O ₃	425.27	426
1489		C ₂₄ H ₃₃ N ₃ O ₃	411.25	412
1490		C ₂₂ H ₂₉ N ₅ O ₂	395.23	396
1491		C ₂₃ H ₂₅ N ₅ O ₂	403.20	404
1492		C ₂₃ H ₂₅ N ₅ O ₂	403.20	404
1493		C ₂₀ H ₂₂ N ₆ O	362.19	363

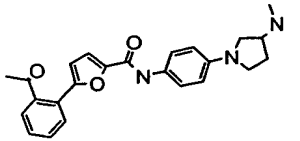
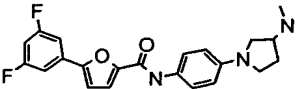
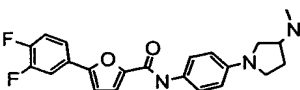
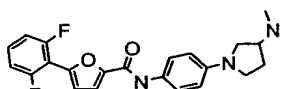
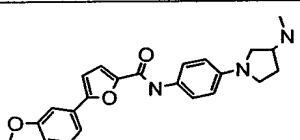
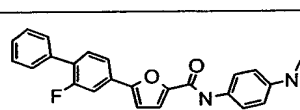
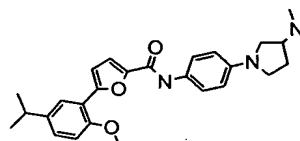
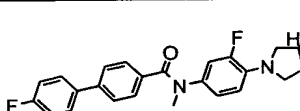
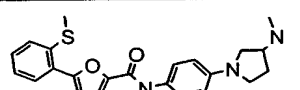
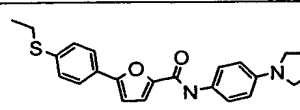
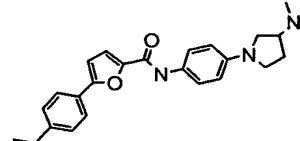
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1494		C ₂₅ H ₂₅ N ₅ O ₂	427.20	428
1495		C ₂₃ H ₂₅ N ₃ O ₂	375.20	376
1496		C ₁₉ H ₂₁ N ₅ O ₂	351.17	352
1497		C ₂₀ H ₂₂ N ₄ OS ₂	398.12	399
1498		C ₂₁ H ₂₃ N ₅ O	361.19	362
1499		C ₂₀ H ₂₂ N ₆ O	362.19	363
1500		C ₂₂ H ₂₈ FN ₃ O ₂	385.22	386
1501		C ₂₃ H ₂₉ FN ₃ O ₂	412.23	413
1502		C ₂₂ H ₃₄ FN ₃ O ₂	391.26	392
1503		C ₂₃ H ₃₀ FN ₃ O ₂	399.23	400

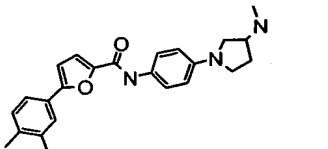
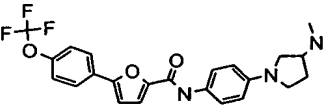
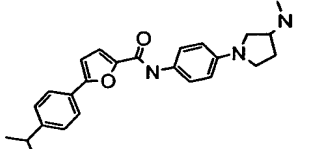
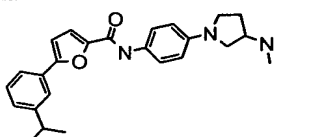
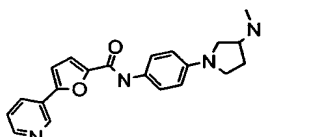
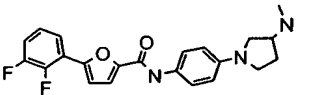
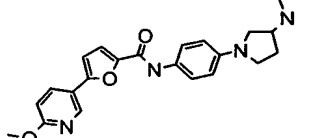
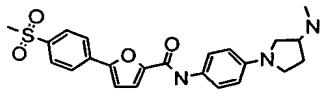
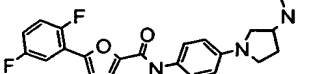
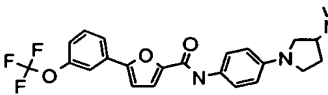
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1504		C ₂₂ H ₂₈ FN ₅ O ₂	413.22	414
1505		C ₂₃ H ₂₄ FN ₅ O ₂	421.19	422
1506		C ₂₃ H ₂₂ F ₃ N ₃ O ₂	429.17	430
1507		C ₂₄ H ₂₈ N ₄ O ₂	404.22	405
1508		C ₂₈ H ₃₃ N ₃ O ₂	443.26	444
1509		C ₂₄ H ₂₄ N ₄ O ₂	400.19	401
1510		C ₂₄ H ₂₆ N ₄ O ₃	418.20	419
1511		C ₂₃ H ₃₀ FN ₃ O ₂	399.23	400
1512		C ₂₂ H ₂₇ FN ₄ O ₄	430.20	431
1513		C ₂₂ H ₂₉ FN ₄ O ₂	400.23	401

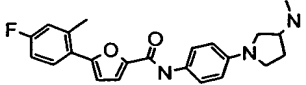
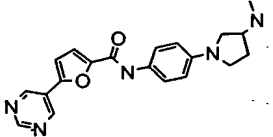
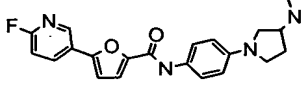
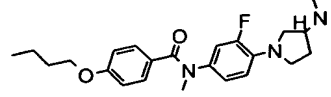
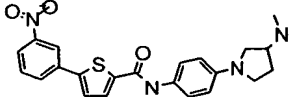
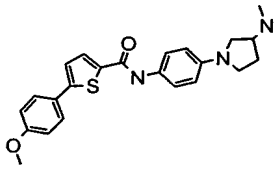
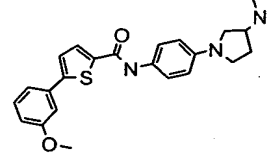
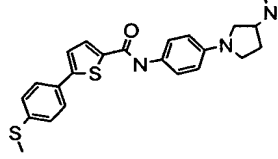
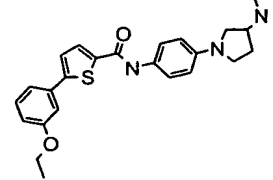
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1514		C ₂₄ H ₂₆ N ₄ O ₃	418.20	419
1515		C ₂₃ H ₃₀ FN ₃ O ₂	399.23	400
1516		C ₂₄ H ₂₉ FN ₄ O	408.23	409
1517		C ₂₅ H ₂₆ FN ₃ O ₂	419.20	420
1518		C ₂₅ H ₂₆ FN ₃ O ₂	419.20	420
1519		C ₂₄ H ₂₆ FN ₃ O ₂ S	439.17	440
1520		C ₂₄ H ₃₀ FN ₃ O	395.24	396
1521		C ₂₅ H ₃₂ FN ₃ O	409.25	410
1522		C ₂₆ H ₂₇ F ₂ N ₃ O	435.21	436
1523		C ₂₂ H ₂₁ ClFN ₃ O ₂	413.13	414
1524		C ₂₂ H ₂₂ FN ₃ O ₂	379.17	380

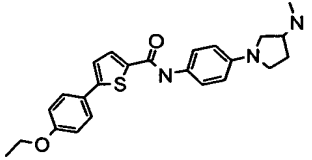
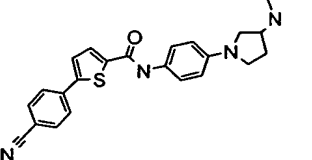
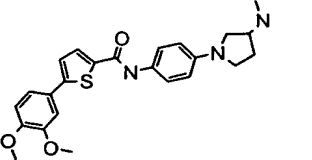
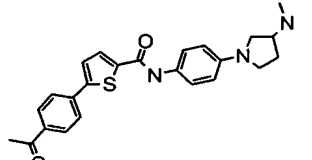
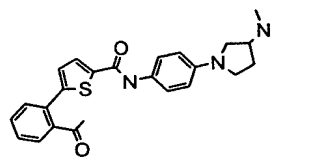
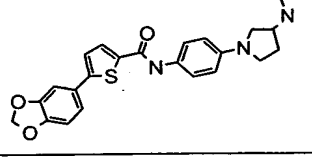
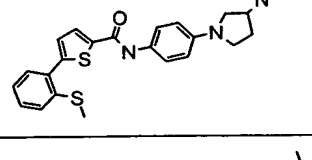
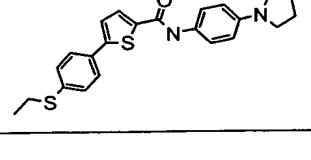
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1525		C ₂₃ H ₂₅ N ₃ O ₃	391.19	392
1526		C ₂₃ H ₂₅ N ₃ O ₃	391.19	392
1527		C ₂₂ H ₂₂ FN ₃ O ₂	379.17	380
1528		C ₂₃ H ₂₅ N ₃ O ₂ S	407.17	408
1529		C ₂₃ H ₂₅ N ₃ O ₂	375.20	376
1530		C ₂₄ H ₂₇ N ₃ O ₃	405.20	406
1531		C ₂₃ H ₃₀ FN ₃ O ₂	399.23	400
1532		C ₂₅ H ₃₁ ClFN ₃ O	443.21	444
1533		C ₂₄ H ₂₅ ClFN ₃ O ₃	457.16	458
1534		C ₂₄ H ₃₀ FN ₃ O ₂	411.23	412
1535		C ₂₄ H ₂₇ N ₃ O ₃	405.20	406
1536		C ₂₃ H ₂₂ N ₄ O ₂	386.17	387

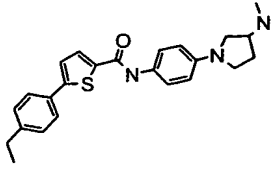
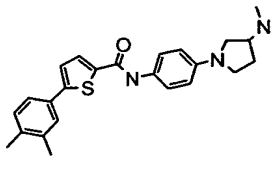
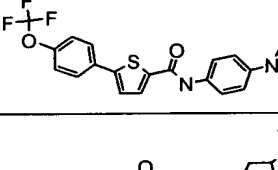
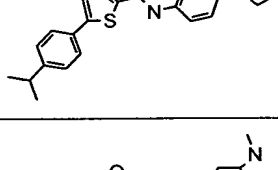
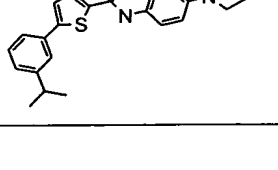
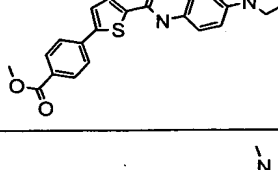
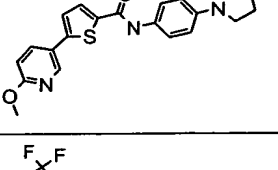
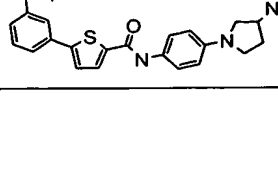
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1537		C ₂₄ H ₂₅ N ₃ O ₃	403.19	404
1538		C ₂₄ H ₂₇ N ₃ O ₄	421.20	422
1539		C ₂₄ H ₂₅ N ₃ O ₃	403.19	404
1540		C ₂₄ H ₂₅ FN ₄ O ₄	452.19	453
1541		C ₂₃ H ₃₀ FN ₃ O ₂	399.23	400
1542		C ₂₅ H ₂₆ FN ₃ O	403.21	404
1543		C ₂₆ H ₂₈ FN ₃ O ₂	433.22	434
1544		C ₂₈ H ₂₉ FN ₄ O ₂	472.23	473
1545		C ₂₆ H ₂₈ FN ₃ O	417.22	418
1546		C ₂₄ H ₃₂ FN ₃ O ₂	413.25	414
1547		C ₂₂ H ₁₈ F ₅ N ₃ O ₂	451.13	452

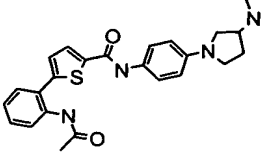
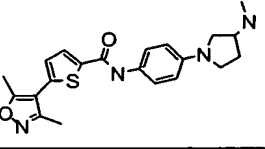
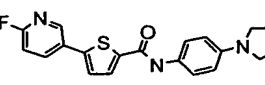
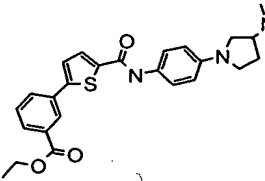
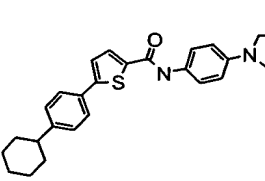
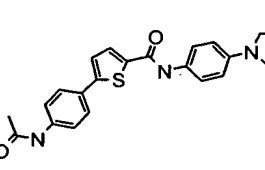
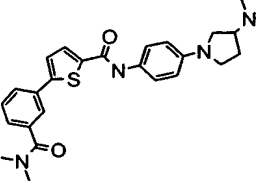
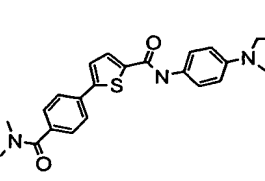
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1548		C ₂₄ H ₂₅ N ₃ O ₃	403.19	404
1549		C ₂₂ H ₂₁ F ₂ N ₃ O ₂	397.16	398
1550		C ₂₂ H ₂₁ F ₂ N ₃ O ₂	397.16	398
1551		C ₂₂ H ₂₁ F ₂ N ₃ O ₂	397.16	398
1552		C ₂₃ H ₂₃ N ₃ O ₄	405.17	406
1553		C ₂₈ H ₂₆ FN ₃ O ₂	455.20	456
1554		C ₂₆ H ₃₁ N ₃ O ₃	433.24	434
1555		C ₂₅ H ₂₅ F ₂ N ₃ O	421.20	422
1556		C ₂₃ H ₂₅ N ₃ O ₂ S	407.17	408
1557		C ₂₄ H ₂₇ N ₃ O ₂ S	421.18	422
1558		C ₂₄ H ₂₇ N ₃ O ₂	389.21	390

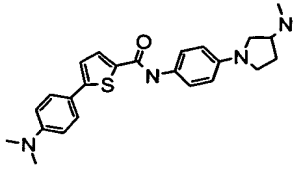
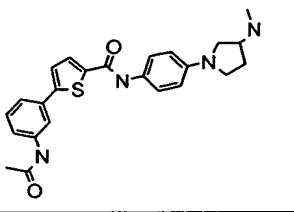
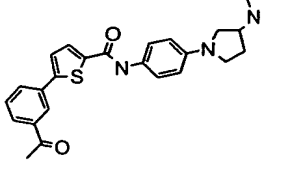
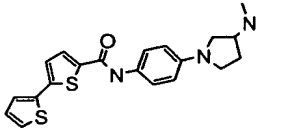
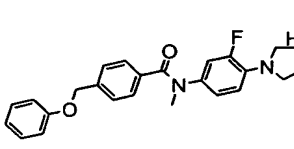
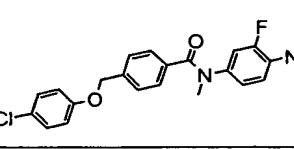
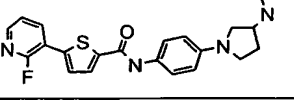
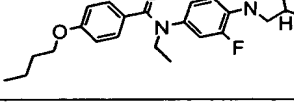
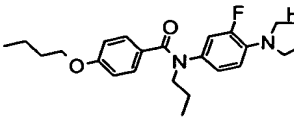
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1559		C ₂₄ H ₂₇ N ₃ O ₂	389.21	390
1560		C ₂₃ H ₂₂ F ₃ N ₃ O ₃	445.16	446
1561		C ₂₅ H ₂₉ N ₃ O ₂	403.23	404
1562		C ₂₅ H ₂₉ N ₃ O ₂	403.23	404
1563		C ₂₁ H ₂₂ N ₄ O ₂	362.17	363
1564		C ₂₂ H ₂₁ F ₂ N ₃ O ₂	397.16	398
1565		C ₂₂ H ₂₄ N ₄ O ₃	392.18	393
1566		C ₂₃ H ₂₅ N ₃ O ₄ S	439.16	440
1567		C ₂₂ H ₂₁ F ₂ N ₃ O ₂	397.16	398
1568		C ₂₃ H ₂₂ F ₃ N ₃ O ₃	445.16	446

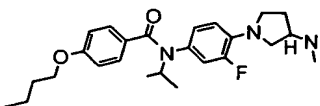
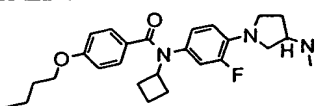
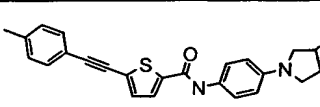
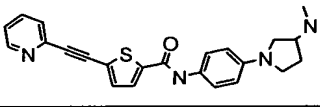
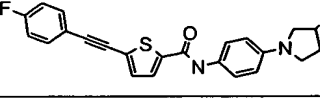
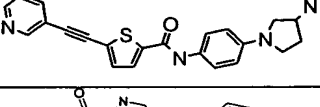
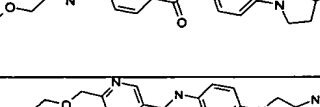
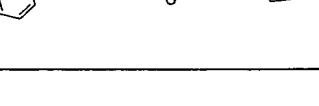
Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1569		C ₂₃ H ₂₄ FN ₃ O ₂	393.18	394
1570		C ₂₀ H ₂₁ N ₅ O ₂	363.17	364
1571		C ₂₁ H ₂₁ FN ₄ O ₂	380.17	381
1572		C ₂₃ H ₃₀ FN ₃ O ₂	399.23	400
1573		C ₂₂ H ₂₂ N ₄ O ₃ S	422.14	423
1574		C ₂₃ H ₂₅ N ₃ O ₂ S	407.17	408
1575		C ₂₃ H ₂₅ N ₃ O ₂ S	407.17	408
1576		C ₂₃ H ₂₅ N ₃ OS ₂	423.14	424
1577		C ₂₄ H ₂₇ N ₃ O ₂ S	421.18	422

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1578		C ₂₄ H ₂₇ N ₃ O ₂ S	421.18	422
1579		C ₂₃ H ₂₂ N ₄ OS	402.15	403
1580		C ₂₄ H ₂₇ N ₃ O ₃ S	437.18	438
1581		C ₂₄ H ₂₅ N ₃ O ₂ S	419.17	420
1582		C ₂₄ H ₂₅ N ₃ O ₂ S	419.17	420
1583		C ₂₃ H ₂₃ N ₃ O ₃ S	421.15	422
1584		C ₂₃ H ₂₅ N ₃ OS ₂	423.14	424
1585		C ₂₄ H ₂₇ N ₃ OS ₂	437.16	438

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1586		C ₂₄ H ₂₇ N ₃ OS	405.19	406
1587		C ₂₄ H ₂₇ N ₃ OS	405.19	406
1588		C ₂₃ H ₂₂ F ₃ N ₃ O ₂ S	461.14	462
1589		C ₂₅ H ₂₉ N ₃ OS	419.20	420
1590		C ₂₅ H ₂₉ N ₃ OS	419.20	420
1591		C ₂₄ H ₂₅ N ₃ O ₃ S	435.16	436
1592		C ₂₂ H ₂₄ N ₄ O ₂ S	408.16	409
1593		C ₂₃ H ₂₂ F ₃ N ₃ O ₂ S	461.14	462

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1594		C ₂₄ H ₂₆ N ₄ O ₂ S	434.18	435
1595		C ₂₁ H ₂₄ N ₄ O ₂ S	396.16	397
1596		C ₂₁ H ₂₁ FN ₄ OS	396.14	397
1597		C ₂₅ H ₂₇ N ₃ O ₃ S	449.18	450
1598		C ₂₈ H ₃₃ N ₃ OS	459.23	460
1599		C ₂₄ H ₂₆ N ₄ O ₂ S	434.18	435
1600		C ₂₅ H ₂₈ N ₄ O ₂ S	448.19	449
1601		C ₂₅ H ₂₈ N ₄ O ₂ S	448.19	449

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1602		C ₂₄ H ₂₈ N ₄ OS	420.20	421
1603		C ₂₄ H ₂₆ N ₄ O ₂ S	434.18	435
1604		C ₂₄ H ₂₅ N ₃ O ₂ S	419.17	420
1605		C ₂₀ H ₂₁ N ₃ OS ₂	383.11	384
1606		C ₂₆ H ₂₈ FN ₃ O ₂	433.22	434
1607		C ₂₆ H ₂₇ ClFN ₃ O ₂	467.18	468
1608		C ₂₁ H ₂₁ FN ₄ OS	396.14	397
1609		C ₂₄ H ₃₂ FN ₃ O ₂	413.25	414
1610		C ₂₅ H ₃₄ FN ₃ O ₂	427.26	428

Ex. No.	Structure	Molecular formula	Monoisotopic molecular wt.	M+H ⁺
1611		C ₂₅ H ₃₄ FN ₃ O ₂	427.26	428
1612		C ₂₆ H ₃₄ FN ₃ O ₂	439.26	440
1613		C ₂₅ H ₂₅ N ₃ OS	415.17	416
1614		C ₂₃ H ₂₂ N ₄ OS	402.15	403
1615		C ₂₄ H ₂₂ FN ₃ OS	419.15	420
1616		C ₂₃ H ₂₂ N ₄ OS	402.15	403
1617		C ₂₁ H ₂₇ N ₅ O ₃	397.21	398
1618		C ₂₅ H ₂₈ N ₄ O ₂	416.22	417

Syntheses of pyrrolidinylanilines required as intermediates

[1-(4-Amino-2-chlorophenyl)pyrrolidin-3-yl]dimethylamine

5 Method C-a

3-Dimethylaminopyrrolidine (0.34 g) was slowly added to a solution of 2-chloro-1 fluoro-4-nitrobenzene (0.52 g) in DMF (5 ml). After 1 hour, ethyl acetate (30 ml) was added to the reaction mixture, and it was extracted with 10% hydrochloric acid (2 × 20 ml). The aqueous phase was washed with ethyl acetate (2 × 20 ml), adjusted to pH > 10 with 10% ammonia and extracted with ethyl acetate. The yellow solution was dried with sodium sulfate, filtered and concentrated in a rotary evaporator. The residue was then dissolved in dichloromethane (50 ml), zinc (10 g) was added, and

glacial acetic acid (5 ml) was slowly added dropwise while cooling in ice. The suspension was stirred for 15 minutes, filtered, washed with 10% ammonia (2 × 20 ml) and concentrated. This resulted in the product with the molecular weight of 239.75 (C₁₂H₁₈ClN₃); MS (ESI): 239 (M+H⁺), 240 (M+H⁺),

5-Amino-2-(3-dimethylaminopyrrolidin-1-yl)benzonitrile

Dimethylaminopyrrolidine was treated with 2-fluoro-5-nitrobenzonitrile and subsequently reduced by method C-a. This resulted in the product with the molecular weight of 230.32 (C₁₃H₁₈N₄); MS (ESI): 231 (M+H⁺),

[1-(4-Amino-3-chlorophenyl)pyrrolidin-3-yl]dimethylamine

Dimethylaminopyrrolidine was treated with 3-chloro-1-fluoro-4-nitrobenzene and subsequently reduced by method C-a. This resulted in the product with the molecular weight of 239.75 (C₁₂H₁₈ClN₃); MS (ESI): 239 (M+H⁺), 240 (M+H⁺),

[1-(4-Amino-3-methylphenyl)pyrrolidin-3-yl]dimethylamine

Dimethylaminopyrrolidine was treated with 4-fluoro-2-methyl-1-nitrobenzene and subsequently reduced by method C-a. This resulted in the product with the molecular weight of 219.33 (C₁₃H₂₁N₃); MS (ESI): 220 (M+H⁺).

tert-Butyl (R)-[1-(4-amino-2-fluorophenyl)pyrrolidin-3-yl]methylcarbamate

Method C-b

tert-Butyl (R)-(+)-pyrrolidin-3-ylcarbamate (1.86 g) was slowly added to a suspension of 3,4-difluoronitrobenzene (1.59 g) and potassium carbonate (2.8 g) in DMF (10 ml). After 10 minutes, ethyl acetate (50 ml) was added, and the mixture was washed with water (3 × 50 ml) in a separating funnel, dried with sodium sulfate, filtered and concentrated. The residue was dissolved in DMF (10 ml), and sodium hydride (0.48 g) was added. After 15 minutes, methyl iodide (1.41 g) was then added while cooling in ice. After 30 minutes, ethyl acetate (50 ml) was added, and the mixture was washed with water (3 × 50 ml) in a separating funnel, dried with sodium sulfate, filtered and concentrated. The substance was then treated as described for method B. This resulted in the product with the molecular weight of 309.39 (C₁₆H₂₄FN₃O₂); MS (ESI): 310 (M+H⁺).

tert-Butyl (S)-[1-(4-amino-2-fluorophenyl)pyrrolidin-3-yl]methylcarbamate

was obtained analogously.

tert-Butyl (R)-[1-(2-fluoro-4-isopropylaminophenyl)pyrrolidin-3-yl]methylcarbamate

- 5 tert-Butyl (R)-[1-(4-amino-2-fluorophenyl)pyrrolidin-3-yl]methylcarbamate was alkylated with acetone using triacetoxyborohydride as reducing agent by method N. This resulted in the product with the molecular weight of 351.47 (C₁₉H₃₀FN₃O₂); MS (ESI): 352 (M+H⁺).

- 10 tert-Butyl (R)-[1-(2-Fluoro-4-cyclobutylaminophenyl)pyrrolidin-3-yl]methylcarbamate

- tert-Butyl (R)-[1-(4-amino-2-fluorophenyl)pyrrolidin-3-yl]methylcarbamate was alkylated with cyclobutanone using triacetoxyborohydride as reducing agent by method N. This resulted in the product with the molecular weight of 363.48 (C₂₀H₃₀FN₃O₂); MS (ESI): 364 (M+H⁺).
- 15

tert-Butyl (R)-[1-(2-fluoro-4-methylaminophenyl)pyrrolidin-3-yl]methylcarbamate

- 20 tert-Butyl (R)-{1-[4-(benzyloxycarbonylmethylamino)-2-fluorophenyl]pyrrolidin-3-yl}-methylcarbamate was treated as described for method B. This resulted in the product with the molecular weight of 323.41 (C₁₇H₂₆FN₃O₂); MS (ESI): 324 (M+H⁺).

- 25 tert-Butyl (R)-{1-[4-(benzyloxycarbonylmethylamino)-2-fluorophenyl]pyrrolidin-3-yl}-methylcarbamate

- tert-Butyl (R)-(+)-[1-(4-amino-2-fluorophenyl)pyrrolidin-3-yl]methylcarbamate (0.93 g) was added to a solution of N-(benzyloxycarbonyloxy)succinimide (2.49 g) in dichloromethane (30 ml). After 12 hours, the mixture was washed with water (2 × 30 ml), dried sodium sulfate, filtered and concentrated. The residue was recrystallized from acetonitrile. The product obtained in this way was dissolved in DMF (10 ml), and sodium hydride (0.24 g) was added. After 15 minutes, methyl iodide (0.71 g) was added while cooling in ice. After 15 minutes, ethyl acetate (50 ml) was added, and the mixture was washed with water (3 × 30 ml), dried sodium sulfate, filtered and concentrated. This resulted in the product with the molecular weight of 457.55 (C₂₅H₃₂FN₃O₄); MS (ESI): 458 (M+H⁺).
- 30
- 35

(R)-[1-(2-Fluoro-4-methylaminophenyl)pyrrolidin-3-yl]dimethylamine

(R)-{1-[4-(Benzyloxycarbonylmethylamino)-2-fluorophenyl]pyrrolidin-3-yl}methylcarbamic acid tert-butyl ester was treated by method G, and the resulting amine was methylated by method M. Finally, hydrogenation was carried out by method B. This resulted in the product with the molecular weight of 237.32 (C₁₃H₂₀FN₃); MS (ESI): 238 (M+H⁺).

Dimethyl-[1-(4-methylaminophenyl)pyrrolidin-3-yl]amine can be prepared analogously.

2-Dimethylamino-N-[1-(2-fluoro-4-methylaminophenyl)pyrrolidin-3-yl]-N-methylacetamide

(R)-{1-[4-(Benzyloxycarbonylmethylamino)-2-fluorophenyl]pyrrolidin-3-yl}methylcarbamic acid tert-butyl ester was treated by method G, and the resulting amine was reacted with N,N-dimethylglycine by method E. Finally, hydrogenation was carried out by method B. This resulted in the product with the molecular weight of 308.40 (C₁₆H₂₅FN₄O); MS (ESI): 309 (M+H⁺).

tert-Butyl (R)-[1-(4-amino-3-fluorophenyl)pyrrolidin-3-yl]methylcarbamate
2,4-Difluoronitrobenzene was treated with tert-butyl (R)-(+)-pyrrolidin-3-ylcarbamate, methylated and subsequently hydrogenated by method C-b. This resulted in the product with the molecular weight of 309.39 (C₁₆H₂₄FN₃O₂); MS (ESI): 310 (M+H⁺).

tert-Butyl [1-(4-aminonaphthalen-1-yl)pyrrolidin-3-yl]methylcarbamate
Method C-c

tert-Butyl methylpyrrolidin-3-ylcarbamate (1.86 g) was slowly added to a suspension of 4-fluoro-1-nitronaphthalene (1.91 g) and potassium carbonate (2.8 g) in DMF (10 ml). After 10 minutes, ethyl acetate (50 ml) was added, and the mixture was washed with water (3 × 50 ml) in a separating funnel, dried with sodium sulfate, filtered and concentrated. The substance was then treated as described for method B. This resulted in the product with the molecular weight of 341.46 (C₂₀H₂₇N₃O₂); MS (ESI): 342 (M+H⁺).

tert-Butyl [1-(4-amino-3-bromophenyl)pyrrolidin-3-yl]methylcarbamate
2-Bromo-4-fluoro-1-nitrobenzene was treated with tert-butyl methylpyrrolidin-3-ylcarbamate and subsequently reduced by method C-a. This resulted in the product with the molecular weight of 370.29 (C₁₆H₂₄BrN₃O₂); MS (ESI): 370 (M+H⁺), 372 (M+H⁺).

- Tert-butyl [1-(4-amino-3-cyanophenyl)pyrrolidin-3-yl]methylcarbamate
2-Cyano-4-fluoro-1-nitrobenzene was treated with tert-butyl
methylpyrrolidin-3-yl-carbamate and subsequently reduced by method C-a.
5 This resulted in the product with the molecular weight of 316.41
(C₁₇H₂₄N₄O₂); MS (ESI): 317 (M+H⁺).
- tert-Butyl [1-(5-amino-6-chloropyridin-2-yl)pyrrolidin-3-yl]methylcarbamate
2-Chloro-6-fluoro-3-nitropyridine was treated with tert-butyl
10 methylpyrrolidin-3-ylcarbamate and subsequently reduced by method C-c.
This resulted in the product with the molecular weight of 326.83
(C₁₅H₂₃ClN₄O₂); MS (ESI): 326 (M+H⁺), 327 (M+H⁺).
- tert-Butyl [1-(4-amino-2,3-difluorophenyl)pyrrolidin-3-yl]methylcarbamate
15 2,3,4-Trifluoronitrobenzene was treated with tert-butyl methylpyrrolidin-3-
ylcarbamate and subsequently reduced by method C-c. This resulted in the
product with the molecular weight of 327.38 (C₁₆H₂₃F₂N₃O₂); MS (ESI):
328 (M+H⁺).
- tert-Butyl [1-(4-amino-2-bromophenyl)pyrrolidin-3-yl]methylcarbamate
20 3-Bromo-4-fluoro-1-nitrobenzene was treated with tert-butyl
methylpyrrolidin-3-ylcarbamate and subsequently reduced by method C-a.
This resulted in the product with the molecular weight of 370.29
(C₁₆H₂₄BrN₃O₂); MS (ESI): 370 (M+H⁺), 372 (M+H⁺).
25
- tert-Butyl [1-(4-amino-2,6-difluorophenyl)pyrrolidin-3-yl]methylcarbamate
3,4,5-Trifluoronitrobenzene was treated with tert-butyl methylpyrrolidin-3-yl-
carbamate and subsequently hydrogenated by method C-c. This resulted in
the product with the molecular weight of 327.38 (C₁₆H₂₃F₂N₃O₂); MS
30 (ESI): 328 (M+H⁺).
- tert-Butyl (R)-[1-(4-amino-2-hydroxymethylphenyl)pyrrolidin-3-yl]carbamate
(2-Fluoro-5-nitrophenyl)methanol was treated with tert-butyl (R)-(+)-
pyrrolidin-3-ylcarbamate and subsequently hydrogenated by method C-c.
35 This resulted in the product with the molecular weight of 307.40
(C₁₆H₂₅N₃O₃); MS (ESI): 308 (M+H⁺).
- tert-Butyl [1-(4-amino-2-chlorophenyl)pyrrolidin-3-yl]methylcarbamate
2-Chloro-1-fluoro-4-nitrobenzene was treated with tert-butyl

methylpyrrolidin-3-ylcarbamate and subsequently hydrogenated by method C-c. This resulted in the product with the molecular weight of 311.81 (C₁₅H₂₂ClN₃O₂); MS (ESI): 311 (M+H⁺), 312 (M+H⁺).

- 5 tert-Butyl [1-(4-amino-2,5-difluorophenyl)pyrrolidin-3-yl]methylcarbamate
3,4,6-Trifluoronitrobenzene was treated with tert-butyl methylpyrrolidin-3-ylcarbamate and subsequently hydrogenated by method C-c. This resulted in the product with the molecular weight of 327.38 (C₁₆H₂₃F₂N₃O₂); MS (ESI): 328 (M+H⁺).

10

tert-Butyl [1-(4-amino-2-methylphenyl)pyrrolidin-3-yl]methylcarbamate
tert-Butyl 4-fluoro-3-methylnitrobenzene was treated with tert-butyl methylpyrrolidin-3-yl-carbamate and subsequently hydrogenated by method C-c. This resulted in the product with the molecular weight of
15 291.40 (C₁₆H₂₅N₃O₂); MS (ESI): 292 (M+H⁺).

tert-Butyl [1-(4-amino-3-trifluoromethylphenyl)pyrrolidin-3-yl]methylcarbamate

- 4-Fluoro-2-trifluoromethylnitrobenzene was treated with tert-butyl
20 methylpyrrolidin-3-yl-carbamate and subsequently hydrogenated by method C-c. This resulted in the product with the molecular weight of 345.37 (C₁₆H₂₂F₃N₃O₂); MS (ESI): 346 (M+H⁺).

- tert-Butyl [1-(4-amino-2-chloro-3-fluorophenyl)pyrrolidin-3-yl]methylcarbamate
25 2,4-Difluoro-3-chloronitrobenzene was treated with tert-butyl methylpyrrolidin-3-yl-carbamate and subsequently hydrogenated by method C-c. This resulted in the product with the molecular weight of 329.80 (C₁₅H₂₁ClN₃O₂); MS (ESI): 329 (M+H⁺), 330 (M+H⁺).

30

tert-Butyl [1-(4-amino-2-cyanophenyl)pyrrolidin-3-yl]methylcarbamate
3-Cyano-4-fluoronitrobenzene was treated with tert-butyl methylpyrrolidin-3-yl-carbamate and subsequently hydrogenated by method C-c. This resulted in the product with the molecular weight of 302.38 (C₁₆H₂₂N₄O₂);
35 MS (ESI): 303 (M+H⁺).

tert-Butyl [1-(4-amino-5-chloro-2-methylphenyl)pyrrolidin-3-yl]methylcarbamate

1-Chloro-5-fluoro-4-methyl-2-nitrobenzene was treated with tert-butyl

methylpyrrolidin-3-ylcarbamate and subsequently hydrogenated by method C-c. This resulted in the product with the molecular weight of 325.84 (C₁₆H₂₄ClN₃O₂); MS (ESI): 325 (M+H⁺), 326 (M+H⁺).

5 tert-Butyl (R)-[1-(5-aminopyridin-2-yl)pyrrolidin-3-yl]methylcarbamate
2-Chloro-5-nitropyridine was treated with tert-butyl (R)-(+)-pyrrolidin-3-yl-
carbamate and subsequently hydrogenated by method C-b. This resulted in
the product with the molecular weight of 322.37 (C₁₆H₂₄FN₃O₂); MS
(ESI): 323 (M+H⁺).

10

tert-Butyl [1-(5-aminopyridin-2-yl)pyrrolidin-3-yl]methylcarbamate
2-Chloro-5-nitropyridine was treated with tert-butyl methylpyrrolidin-3-yl-
carbamate and subsequently hydrogenated by method C-c. This resulted in
the product with the molecular weight of 322.37 (C₁₆H₂₄FN₃O₂); MS
15 (ESI): 323 (M+H⁺).

tert-Butyl (R)-[1-(4-aminophenyl)pyrrolidin-3-yl]methylcarbamate
4-Fluoronitrobenzene was treated with tert-butyl (R)-(+)-pyrrolidin-3-yl-
carbamate and subsequently hydrogenated by method C-b. This resulted in
20 the product with the molecular weight of 291.40 (C₁₆H₂₅N₃O₂); MS (ESI):
292 (M+H⁺).

tert-Butyl [1-(4-amino-2-trifluoromethylphenyl)pyrrolidin-3-
yl]methylcarbamate

25

4-Fluoro-3-trifluoromethylnitrobenzene was treated with tert-butyl
methylpyrrolidin-3-yl-carbamate and subsequently hydrogenated by
method C-c. This resulted in the product with the molecular weight of
345.37 (C₁₆H₂₂F₃N₃O₂); MS (ESI): 346 (M+H⁺).

30

tert-Butyl [1-(5-amino-4-methylpyridin-2-yl)pyrrolidin-3-yl]methylcarbamate
2-Chloro-4-methyl-5-nitropyridine was treated with tert-butyl
methylpyrrolidin-3-ylcarbamate and subsequently hydrogenated by method
C-c. This resulted in the product with the molecular weight of 306.419
(C₁₆H₂₆N₄O₂); MS (ESI): 306 (M+H⁺), 307 (M+H⁺).

35

tert-Butyl [1-(5-amino-3-methylpyridin-2-yl)pyrrolidin-3-yl]methylcarbamate
2-Chloro-3-methyl-5-nitropyridine was treated with tert-butyl
methylpyrrolidin-3-yl-carbamate and subsequently hydrogenated by
method C-c. This resulted in the product with the molecular weight of

306.419 (C₁₆H₂₆N₄O₂); MS (ESI): 306 (M+H⁺), 307 (M+H⁺).

tert-Butyl [1-(4-amino-2-hydroxymethylphenyl)pyrrolidin-3-yl]methylcarbamate

- 5 (2-Fluoro-5-nitrophenyl)methanol was treated with tert-butyl methylpyrrolidin-3-yl-carbamate and subsequently hydrogenated by method C-c. This resulted in the product with the molecular weight of 321.42 (C₁₇H₂₇N₃O₃); MS (ESI): 322 (M+H⁺).

- 10 tert-Butyl [1-(4-amino-3-chloro-2-cyanophenyl)pyrrolidin-3-yl]methylcarbamate

2-Chloro-6-fluoro-3-nitrobenzonitrile was treated with tert-butyl methylpyrrolidin-3-yl-carbamate and subsequently hydrogenated by method C-c. This resulted in the product with the molecular weight of 350.5 (C₁₇H₂₃ClN₄O₂); MS (ESI): 350 (M+H⁺), 351 (M+H⁺).

- 15

tert-Butyl [1-(4-amino-3-methylphenyl)pyrrolidin-3-yl]methylcarbamate
4-Fluoro-2-methylnitrobenzene was treated with tert-butyl methylpyrrolidin-3-ylcarbamate and subsequently hydrogenated by method C-c. This
20 resulted in the product with the molecular weight of 291.40 (C₁₆H₂₅N₃O₂); MS (ESI): 292 (M+H⁺).

tert-Butyl [1-(5-aminopyridin-2-yl)pyrrolidin-3-yl]carbamate

- 25 2-Chloro-5-nitropyridine was treated with tert-butyl (R)-(+)-pyrrolidin-3-ylcarbamate and subsequently hydrogenated by method C-c. This resulted in the product with the molecular weight of 278.36 (C₁₄H₂₂N₄O₂); MS (ESI): 279 (M+H⁺).

5-(3-Dimethylaminopyrrolidin-1-yl)pyridin-2-ylamine

- 30 A suspension of 5-bromo-2-nitropyridine (2 g), 3-(dimethylamino)pyrrolidine (1.14 g), (R)-(+)-2,2'-bis(diphenylphosphino)-1,1'-binaphthyl (0.5 g), palladium(II) acetate (0.09 g), cesium carbonate (4.5 g) in toluene (20 ml) was heated at 100°C for 3 hours. Cooling to room temperature was followed by extraction with 1N hydrochloric acid (2 × 100 ml). The aqueous
35 phase was adjusted to pH > 10 with ammonia, extracted with ethyl acetate (2 × 100 ml), dried with sodium sulfate, filtered and concentrated. The substance was then treated as described for method B. This resulted in the product with the molecular weight of 206.29 (C₁₁H₁₈N₄); MS (ESI): 207 (M+H⁺).

N-[1-(4-Aminophenyl)-4-hydroxypyrrolidin-3-yl]-N-methylacetamide
trans-N-(4-Hydroxypyrrolidin-3-yl)-N-methylacetamide was reacted with
4-fluoronitrobenzene by method C, and the product was subsequently
5 hydrogenated by method B. This resulted in the product with the molecular
weight of 249.32 (C₁₃H₁₉N₃O₂); MS (ESI): 250 (M+H⁺).

trans-N-(4-Hydroxypyrrolidin-3-yl)-N-methylacetamide
tert-Butyl trans-3-hydroxy-4-methylaminopyrrolidin-1-carboxylate (1.0 g,
10 tetrahedron: Asymmetry 2001, 12, 2989) was mixed with pyridine (1.5 g)
and acetic anhydride (0.567 g). After 3 hours, volatile fractions were
removed under high vacuum. The residue was treated by method G. This
resulted in the product with the molecular weight of 158.20 (C₇H₁₄N₂O₂);
MS (ESI): 159 (M+H⁺).

15 trans-1-(4-Aminophenyl)-4-dimethylaminopyrrolidin-3-ol
tert-Butyl 6-oxa-3-azabicyclo[3.1.0]hexane-3-carboxylate (2.0 g,
tetrahedron: Asymmetry 2001, 12, 2989) was stirred with dimethylamine
(40% aq., 10 ml) for 12 hours. The mixture was concentrated and
20 partitioned between water and ethyl acetate. The organic phase was dried
over magnesium sulfate and concentrated. The crude product was treated
by method G. The resulting amine was reacted with 4-fluoronitrobenzene
by method C. The resulting nitro compound was hydrogenated by method
B. This resulted in the product with the molecular weight of 221
25 (C₁₂H₁₉N₃O); MS (ESI): 222 (M+H⁺).

[1-(4-Aminophenyl)-4-methoxypyrrolidin-3-yl]dimethylamine
An alternative possibility is for the nitro compound prepared in the
preceding method to be alkylated with methyl iodide by method F and then
30 hydrogenated by method B. This resulted in the product with the molecular
weight of 235 (C₁₃H₂₁N₃O); MS (ESI): 236 (M+H⁺).

[1-(4-Aminophenyl)pyrrolidin-3-yl]dimethylamine
Dimethylpyrrolidin-3-ylamine was reacted with 4-fluoronitrobenzene by
35 method C, and the product was subsequently hydrogenated by method B.
This resulted in the product with the molecular weight of 205.31
(C₁₂H₁₉N₃); MS (ESI): 206 (M+H⁺).

1-(4-Aminophenyl)-3-dimethylaminopyrrolidin-2-one

Trisodium phosphate (3.56 g) was added to a solution of 4-nitroaniline (5.0 g) in acetonitrile (30 ml) and, at 0°C, 2-bromo-4-chlorobutyryl bromide (11 g) was added. After one hour, a solution of sodium hydroxide (3.2 g) in water (10 ml) was added, and the mixture was vigorously stirred at room temperature. After 6 hours, the same amount of sodium hydroxide solution was again added, and the mixture was left to stand overnight. The reaction solution was diluted with water and extracted with ethyl acetate. The organic phase was dried over magnesium sulfate and concentrated. The crude product (0.5 g) was heated with dimethylamine (160 mg) in toluene (20 ml) at 80°C for 3 hours. The reaction solution was diluted with water and extracted with ethyl acetate. The organic phase was dried over magnesium sulfate and concentrated. The crude product was hydrogenated by method B. This resulted in the product with the molecular weight of 219.29 (C₁₂H₁₇N₃O); MS (ESI): 220 (M+H⁺).

1-(4-Aminophenyl)-3-(7-azabicyclo[2.2.1]hept-7-yl)pyrrolidin-2-one was obtained in an analogous manner.

4-[3-(7-Azabicyclo[2.2.1]hept-7-yl)pyrrolidin-1-yl]phenylamine
1-(4-Nitrophenyl)-3-(7-azabicyclo[2.2.1]hept-7-yl)pyrrolidin-2-one (0.25 g) in THF (10 ml) was mixed with borane-THF complex (1M in THF, 0.83 ml) and boiled under reflux for 3 hours. After the reaction was complete, the mixture was diluted with water and adjusted to pH 9-10 with hydrochloric acid (4N). Extraction in ethyl acetate, drying and concentration of the organic phase afforded a crude product that was hydrogenated by method B. This resulted in the product with the molecular weight of 257.38 (C₁₆H₂₃N₃); MS (ESI): 258 (M+H⁺).

(R)-1'-(4-Aminophenyl)-[1,3']bipyrrolidinyl-2-one
tert-Butyl [1-(4-Nitrophenyl)pyrrolidin-3-yl]carbamate was treated by method G. The crude product (1.4 g) was dissolved in acetonitrile (20 ml) and mixed with trisodium phosphate (0.67 g) and 4-chlorobutyryl chloride (1.1 g). After 2 hours, sodium hydroxide (0.6 g) in water (10 ml) was added and the mixture was vigorously stirred. After 12 hours, the same amount of sodium hydroxide solution was again added, and the mixture was stirred for a further 24 hours. The concentrated reaction solution was partitioned between water and ethyl acetate, and the organic phase was dried and concentrated. The residue was hydrogenated by method B. This resulted in the product with the molecular weight of 245.33 (C₁₄H₁₉N₃O); MS (ESI): 246 (M+H⁺).

- 1-Methylpiperidine-3-carboxylic acid [(R)-1-(4-aminophenyl)pyrrolidin-3-yl]methanamide
tert-Butyl (R)-[1-(4-nitrophenyl)pyrrolidin-3-yl]methylcarbamate was treated
5 by method G and reacted with 1-methylpiperidine-3-carboxylic acid by
method E. Finally, hydrogenation was also carried out by method E. This
resulted in the product with the molecular weight of 316.45 (C₁₈H₂₈N₄O);
MS (ESI): 317 (M+H⁺).
(R)-N-[1-(4-Aminophenyl)pyrrolidin-3-yl]-2-dimethylamino-N-
10 methylacetamide was obtained in an analogous manner using N,N-
dimethylglycine.
- N-[(R)-1-(4-Aminophenyl)pyrrolidin-3-yl]-N-(2-diethylaminoethyl)acetamide
N-(2-Diethylaminoethyl)-N-[(R)-1-(4-nitrophenyl)pyrrolidin-3-yl]acetamide
15 was hydrogenated by method B. This resulted in the product with the
molecular weight of 318.47 (C₁₈H₃₀N₄O); MS (ESI): 319 (M+H⁺).
- N-(2-Diethylaminoethyl)-N-[(R)-1-(4-nitrophenyl)pyrrolidin-3-yl]acetamide
Acetyl chloride (2.9 g) was dissolved in 50 ml of dry dichloromethane,
20 mixed with 5.3 ml of triethylamine, and after addition of N,N-diethyl-N'-[(R)-
1-(4-nitrophenyl)pyrrolidin-3-yl]ethane-1,2-diamine (5.8 g), stirred at room
temperature for 30 minutes. Subsequently, (LCMS check), water (10 ml)
was added to the reaction, and the mixture was extracted with
dichloromethane (2 × 10 ml). The combined organic phases were dried
25 over magnesium sulfate, the solvent was removed, and the crude product
was separated by chromatography on silica gel (dichloromethane/methanol
10:1). This resulted in the product with the molecular weight of 348.45
(C₁₈H₂₈N₄O₃); MS (ESI): 349 (M+H⁺).
- 30 N,N-Diethyl-N'-[(R)-1-(4-nitrophenyl)pyrrolidin-3-yl]ethane-1,2-diamine
tert-Butyl (2-diethylaminoethyl)-[(R)-1-(4-nitrophenyl)pyrrolidin-3-
yl]carbamate (7.9 g) was reacted with trifluoroacetic acid by method G. This
resulted in the product with the molecular weight of 306.41 (C₁₆H₂₆N₄O₂);
MS (ESI): 307 (M+H⁺).

tert-Butyl (2-diethylaminoethyl)-[(R)-1-(4-nitrophenyl)pyrrolidin-3-yl]carbamate

tert-Butyl [(R)-1-(4-nitrophenyl)pyrrolidin-3-yl]carbamate (6.0 g) was dissolved in 50 ml of N,N-dimethylformamide and, after addition of sodium hydride (1.1 g), stirred at room temperature for 30 minutes, and subsequently chlorethyldiethylamine hydrochloride (4.1 g) was added. The mixture was subsequently stirred at room temperature with exclusion of moisture for 4 hours. The reaction was stopped by adding water (50 ml), and this was followed by extraction with ethyl acetate (3 × 50 ml) and drying of the combined organic phases over magnesium sulfate, and removal of the solvent. This resulted in the product with the molecular weight of 406.53 (C₂₁H₃₄N₄O₄); MS (ESI): 407 (M+H⁺).

Piperidine-4-carboxylic acid [4-(3-dimethylaminopyrrolidin-1-yl)phenyl]amide

Piperidine-1,4-dicarboxylic acid mono-tert-butyl ester was reacted with [1-(4-aminophenyl)pyrrolidin-3-yl]dimethylamine by method E, and the product was then treated by method G. This resulted in the product with the molecular weight of 316.45 (C₁₈H₂₈N₄O); MS (ESI): 317 (M+H⁺).

Synthesis of amines required as intermediates

Spiro[1,3-benzodioxol-2,1'-cyclopentane]-5-amine

A solution of spiro[5-nitro-1,3-benzodioxol-2,1'-cyclopentane] (8.8 g) in methanol (90 ml) was hydrogenated under 6 bar in the presence of palladium on carbon (10%, 0.1 g). After 30 minutes at room temperature, the mixture was filtered and concentrated. This resulted in the product with the molecular weight of 191.23 (C₁₁H₁₃NO₂); MS(ESI): 192 (M+H⁺).

Spiro[5-nitro-1,3-benzodioxol-2,1'-cyclopentane]

A solution of spiro[1,3-benzodioxol-2,1'-cyclopentane] (8.5 g) in 20 ml of dichloromethane was added dropwise at 10°C to 65% strength nitric acid (65 ml). After 2 hours at 5-10°C, the mixture was diluted with water, the organic phase was separated off, and the aqueous phase was extracted

twice with dichloromethane. The combined organic phases were washed with water until neutral, dried over sodium sulfate, concentrated and crystallized from heptane. This resulted in the product with the molecular weight of 221.21 (C₁₁H₁₁NO₄); MS(ESI): 222 (M+H⁺).

5

Spiro[1,3-benzodioxol-2,1'-cyclopentane]

Catechol (11 g) and cyclopentanone (9 ml) were heated under reflux in toluene (150 ml) with p-toluenesulfonic acid (0.18 g) with a water trap. After 18 hours, the mixture was concentrated and purified by chromatography (silica gel, heptane/ethyl acetate 4:1). This resulted in the product with the molecular weight of 176.22 (C₁₁H₁₂O₂); MS(ESI): 177 (M+H⁺).

5-Chloro-2',3',5',6'-tetrahydro-1'H-[2,4']bipyridinyl-4'-ol
Butyllithium (15% in hexane; 7.6 ml) was added dropwise to a solution of 2-bromo-5-chloropyridine (2.0 g) in diethyl ether (50 ml) at -78°C and, after one hour, a solution of N-tert-butoxycarbonyl-4-piperidinone (2.1 g) in diethyl ether (10 ml) was added dropwise. After 30 minutes, water was cautiously added, and the mixture was extracted with ethyl acetate. The organic phase was dried over sodium sulfate, filtered and concentrated.
The residue was treated by method G. This resulted in the product with the molecular weight of 212.68 (C₁₀H₁₃ClN₂O); MS(ESI): 213 (M+H⁺).

The following were obtained analogously:

5-Fluoro-2',3',5',6'-tetrahydro-1'H-[2,4']bipyridinyl-4'-ol

6-Chloro-2',3',5',6'-tetrahydro-1'H-[3,4']bipyridinyl-4'-ol.

25

6-Cyclopentyloxy pyridin-3-ylamine

A mixture of 2-hydroxy-5-nitropyridine (1.4 g), cyclopentyl bromide (1.5 g) and potassium carbonate (3 g) was heated in DMF (20 ml) at 80°C for 6 hours. The mixture was diluted with water and extracted with ethyl acetate.
The organic phase was dried over magnesium sulfate and concentrated.
The residue was purified by chromatography on silica gel (mobile phase ethyl acetate/heptane 1:2). The nitro compound obtained in this way was hydrogenated by method B. This resulted in the product with the molecular weight of 178.24 (C₁₀H₁₄N₂O₂); MS(ESI): 179 (M+H⁺).

30

6-(4-Fluorophenyl)-3-azabicyclo[4.1.0]heptane

Diethylzinc (1M in hexane, 19 ml) in dichloromethane (100 ml) was mixed with trifluoroacetic acid (3 ml) at 0°C. After 20 minutes, diiodomethane (3
 5 ml) in dichloromethane (10 ml) was added. Then 4-(4-fluorophenyl)-1,2,3,6-tetrahydropyridine (3.0 g) in dichloromethane (10 ml) was added, and the mixture was stirred at room temperature overnight. After addition of hydrochloric acid (1N), the phases were separated and the organic phase was washed with water, dried over magnesium sulfate and concentrated.
 10 This resulted in the product with the molecular weight of 191.25 (C₁₂H₁₄FN); MS(ESI): 192 (M+H⁺).

Synthesis of carboxylic acids required as intermediates

15

4-(4-Methylpiperidin-1-yl)benzoic acid

4-(4-Methylpiperidin-1-yl)benzonitrile (1.2 g) was heated to reflux with potassium hydroxide (0.7 g) in water (2 ml) and ethylene glycol (8 ml) for 3 hours. The mixture was diluted with water, washed with ethyl acetate and
 20 acidified with 2N hydrochloric acid. The precipitated product was filtered off with suction, dissolved in dichloromethane, dried over sodium sulfate, concentrated and crystallized from diethyl ether. This resulted in the product with the molecular weight of 219.29 (C₁₃H₁₇NO₂); MS(ESI): 220 (M+H⁺).

25

4-(4-Methylpiperidin-1-yl)benzonitrile

4-Fluorobenzonitrile (1.21 g) was heated with 4-methylpiperidine (1.00 g) at 180°C for 1 hour. The mixture was then taken up in ethyl acetate, washed with water, 2N sodium hydroxide solution and saturated sodium
 30 bicarbonate solution, dried over sodium sulfate, concentrated and crystallized from n-pentane. This resulted in the product with the molecular weight of 200.29 (C₁₃H₁₆N₂); MS(ESI): 201 (M+H⁺).

4-Butoxycyclohexanecarboxylic acid

Sodium hydride (2.78 g) was added to a solution of ethyl 4-hydroxycyclohexanecarboxylate (10 g) and butyl iodide (10.6 g) in DMF while cooling in ice under argon. After 12 hours, the mixture was poured onto ice (200 g), extracted with ethyl acetate (100 ml) and then washed with water (3 × 50 ml). The organic phase was concentrated and mixed with ethanol (50 ml) and 5N sodium hydroxide (30 ml). The solution was heated at 60°C for 4 hours. Cooling to room temperature was followed by adjustment to pH < 2 with 2N hydrochloric acid, extraction with ethyl acetate (3 × 50 ml), drying with magnesium sulfate, filtration and concentration. This resulted in the product with the molecular weight of 200.28 (C₁₁H₂₀O₃); MS (ESI): 201 (M+H⁺).

1-Benzyl-1H-[1,2,3]triazole-4-carboxylic acid

Methyl 1-benzyl-1H-[1,2,3]triazol-4-carboxylate (217 mg) was dissolved in 4 ml of methanol and hydrolyzed with 2 ml of 2N sodium hydroxide solution. After acidification with 4 ml of 2N hydrochloric acid, the resulting precipitate was filtered off, taken up in 5 ml of ethyl acetate and purified by preparative HPLC. This resulted in the product with the molecular weight of 203.2 (C₁₀H₉N₃O₂); MS (ESI): 204 (M+H⁺).

Methyl 1-benzyl-1H-[1,2,3]triazole-4-carboxylate

Benzyl azide (266 mg) was dissolved together with sodium ascorbate (20 mg) and copper sulfate (5 mg) in 8 ml of the solvent mixture (*tert*-butanol/water 3:1), and methyl propionate (336 mg) was added. The solution was stirred at room temperature for 2 hours. A white precipitate separated out and was filtered off with suction on a frit and subsequently dried. This resulted in the product with the molecular weight of 217.23 (C₁₁H₁₁N₃O₂); MS (ESI): 218 (M+H⁺).

1-Biphenyl-4-yl-1H-[1,2,3]triazole-4-carboxylic acid was prepared analogously from 4-Ethynylbiphenyl and ethyl azidoacetate.

1-Butyl-1H-indole-5-carboxylic acid

Sodium hydride (50% in oil, 1.4 g) was added to methyl 1H-indole-5-carboxylate (5.0 g) in DMF (100 ml) and, after gas evolution ceased, bromobutane (3.9 g) was added. After 12 hours, the reaction solution was diluted with ethyl acetate and washed three times with water. The organic

- phase was dried over magnesium sulfate and concentrated. The residue was purified by chromatography on silica gel (mobile phase ethyl acetate/heptane 1:6). The resulting ester was dissolved in methanol (10 ml) and boiled under reflux with sodium hydroxide (0.6 g) in water (10 ml) for 12 hours. The mixture was diluted with water and acidified with hydrochloric acid, followed by extraction with ethyl acetate. The organic phase was dried over magnesium sulfate and concentrated. This resulted in the product with the molecular weight of 217.27 ($C_{13}H_{15}NO_2$); MS (ESI): 218 ($M+H^+$).
- 3'-Acetylamino-biphenyl-4-carboxylic acid
3'-Amino-biphenyl-4-carboxylic acid (0.2 g) was mixed with pyridine (0.7 g) and acetic anhydride (180 mg) and, after 14 hours, volatile fractions were removed. The residue was taken up in sodium hydroxide solution (2N) and washed with diethyl ether. The aqueous phase was acidified with hydrochloric acid and extracted with ethyl acetate. The organic phase was dried over magnesium sulfate and concentrated. This resulted in the product with the molecular weight of 255.28 ($C_{15}H_{13}NO_3$); MS (ESI): 256 ($M+H^+$).
- 3'-Isobutyrylamino-biphenyl-4-carboxylic acid
3'-Amino-biphenyl-4-carboxylic acid (0.2 g) was mixed in dichloromethane with potassium carbonate (121 mg) and isobutyryl chloride (94 mg). After 12 hours, the mixture was diluted with sodium hydroxide solution and washed with diethyl ether. The aqueous phase was acidified with hydrochloric acid and extracted with ethyl acetate. The organic phase was dried over magnesium sulfate and concentrated. This resulted in the product with the molecular weight of 283.33 ($C_{17}H_{17}NO_3$); MS (ESI): 284 ($M+H^+$).
- 5-Butoxypyridine-2-carboxylic acid
Sodium hydride (50% in oil, 250 mg) was added to benzhydryl 5-hydroxypyridine-2-carboxylate (2.0 g) dissolved in DMF (20 ml) and, after gas evolution ceased, 1-bromobutane (0.72 g) was added. The mixture was heated at 90°C for 6 hours. It was diluted with water and extracted with ethyl acetate. The organic phase was dried over magnesium sulfate and

concentrated. The residue was hydrogenated in analogy to method B. This resulted in the product with the molecular weight of 195.22 (C₁₀H₁₃NO₃); MS (ESI): 196 (M+H⁺).

- 5 4-Methyl-3,4,5,6-tetrahydro-2H-[1,3']bipyridinyl-6'-carboxylic acid
Benzhydryl 5-trifluoromethanesulfonyloxypyridine-2-carboxylate (3.0 g) was heated with 4-methylpiperidine (1.4 g) at 80°C for one hour. The reaction mixture was immediately purified by preparative HPLC and then hydrogenated in analogy to method. This resulted in the product with the
10 molecular weight of 220.27 (C₁₂H₁₆N₂O₂); MS (ESI): 221 (M+H⁺).

N-[4-(3-Dimethylaminopyrrolidin-1-yl)phenyl]terephthalamic acid

Method P-a

- 15 N-[4-(3-Dimethylaminopyrrolidin-1-yl)phenyl]terephthalamic acid methyl ester (1.7 g) dissolved in methanol (20 ml) was stirred with sodium hydroxide solution (2N, 15 ml) at room temperature for 24 hours. If conversion is incomplete, it is also possible to heat to reflux. The organic solvent was distilled off, and the mixture was acidified with hydrochloric acid. The precipitate which separated out was filtered off with suction and
20 dried. This resulted in the product with the molecular weight of 353.42 (C₂₀H₂₃N₃O₃); MS (ESI): 354 (M+H⁺).

N-[4-(3-Dimethylaminopyrrolidin-1-yl)phenyl]terephthalamic acid methyl ester

- 25 [1-(4-Aminophenyl)pyrrolidin-3-yl]dimethylamine was reacted with terephthalic acid monomethyl ester by method E. This resulted in the product with the molecular weight of 367.45 (C₂₁H₂₅N₃O₃); MS (ESI): 368 (M+H⁺).

- 30 4-(Cyclopentanecarbonylmethylamino)benzoic acid

Methyl 4-methylaminobenzoate was reacted with cyclopentanecarboxylic acid by method E and then hydrolyzed by method P-a. This resulted in the product with the molecular weight of 247.30 (C₁₄H₁₇NO₃); MS (ESI): 248 (M+H⁺).

- 35 The following compounds were obtained analogously:

4-(Cyclopentanecarbonylamino)-3-methoxybenzoic acid

2-Chloro-4-(cyclopentanecarbonylamino)benzoic acid

2-Fluoro-4-(cyclopentanecarbonylamino)benzoic acid

4-(Cyclopentanecarbonylamino)-3-methylbenzoic acid

- 4-(Cyclopentanecarbonylamino)benzoic acid
 4-(Cyclopentanecarbonylamino)-3-trifluoromethoxybenzoic acid
 3-Chloro-4-(cyclopentanecarbonylamino)benzoic acid
 5-Chloro-4-(cyclopentanecarbonylamino)-2-methoxybenzoic acid
 5 4-[(Cyclohex-1-enecarbonyl)amino]benzoic acid
 4-[(Cyclopent-1-enecarbonyl)amino]benzoic acid
- 3-Fluoro-4-(1-methylbutoxy)benzoic acid
 10 A solution of 0.449 g of 1-[3-fluoro-4-(1-methylbutoxy)phenyl]ethanone in 6.8 ml of dioxane was dropped dropwise into 1.36 g of NaOH, 1.6 g of bromine in 6.8 ml of water. The mixture was stirred at room temperature for 30 minutes and then heated at 50°C for 1 h. The excess bromide was decomposed by adding a sodium disulfite solution, and then the solution
 15 was poured into 25% strength hydrochloric acid solution and stirred for 20 minutes. The solution was extracted with ethyl acetate. The combined organic phases dried over sodium sulfate, concentrated in vacuo and purified by preparative HPLC. This resulted in the product with the molecular weight of 226.1 (C₁₂H₁₅FO₃); MS (ESI): 227 (M+H⁺).
- 20 1-[3-Fluoro-4-(1-methylbutoxy)phenyl]ethanone
 0.058 g of NaH was added to a solution of 0.176 g of 2-pentanol in 2 ml of DMF, and the solution was stirred at room temperature for 1 hour. Then 0.312 g of 3,4-difluoroacetophenone was added, and the mixture was
 25 stirred at room temperature overnight. The reaction solution was taken up in ethyl acetate and washed twice with water. The organic phase was dried over sodium sulfate and concentrated in vacuo. The resulting compound was reacted further without further purification.
- The following compounds were obtained analogously:
 30 4-Cyclobutoxy-3-fluorobenzoic acid
 3-Fluoro-4-(2-methylcyclopropylmethoxy)benzoic acid
 4-(2-Cyclopropylethoxy)-3-fluorobenzoic acid
 3-Fluoro-4-(1-methylpiperidin-3-yloxy)benzoic acid
 4-(1-Acetylpiperidin-3-yloxy)-3-fluorobenzoic acid
 35 3-Fluoro-4-(1-methylpyrrolidin-3-yloxy)benzoic acid
 4-(1-Acetylpyrrolidin-3-yloxy)-3-fluorobenzoic acid

3-Fluoro-4-(1-methylpiperidin-3-ylmethoxy)benzoic acid

4-(2,4-Difluorophenoxy)benzoic acid

- 5 0.518 g of potassium hydroxide was added to a solution of 0.428 g of ethyl 4-(2,4-difluorophenoxy)benzoate in 2 ml of THF/water (1:1). The solution was heated at 110°C for 6 hours. The THF was then removed in vacuo, and the aqueous phase was freeze dried and purified by preparative HPLC. This resulted in the product with the molecular weight of 250.04
10 (C₁₃H₈F₂O₃); MS (ESI): 251 (M+H+).

Ethyl 4-(2,4-difluorophenoxy)benzoate

- 0.018 g of NaH was added to a solution of 0.1 g of 2,4-difluorophenol in 0.5 ml of DMF. The reaction was stirred at room temperature for 45 minutes.
15 Then 0.129 g of ethyl 4-fluorobenzoate in 0.5 ml of DMF was added dropwise. The reaction was heated at 110°C overnight. After cooling concentrated in vacuo and the residue taken up in ethyl acetate/water. The ethyl acetate phase was washed three times with water, dried over sodium sulfate, concentrated in vacuo and purified by preparative HPLC. This
20 resulted in the product with the molecular weight of 278.08 (C₁₅H₁₂F₂O₃); MS (ESI): 279 (M+H+)

- 4-(2,4-Difluorophenoxy)benzoic acid was reacted with [1-(4-aminophenyl)pyrrolidin-3-yl]-dimethylamine by method E-b. This resulted in the product with the molecular weight of 437.19 (C₂₅H₂₅F₂N₃O₂); MS
25 (ESI): 438 (M+H+) as hydrotrifluoroacetate.

4-Butoxy-3-methoxybenzoic acid

- Methyl 4-hydroxy-3-methoxybenzoate was alkylated with bromobutane by method H and hydrolyzed by method P-a. This resulted in the product with
30 the molecular weight of 224.26 (C₁₂H₁₆O₄); MS (ESI): 225 (M+H+).

The following compounds were prepared analogously:

- 4-Butoxy-3,5-dichlorobenzoic acid
4-Butoxy-3-nitrobenzoic acid
4-Butoxy-3-chlorobenzoic acid
35 4-Butoxy-3,5-dimethylbenzoic acid

- 4-Butoxy-2,3-dichloro-5-methoxybenzoic acid
- 4-Butoxy-2,3,5,6-tetrafluorobenzoic acid
- 4-Butoxy-3-fluorobenzoic acid
- 3-Acetyl-4-butoxybenzoic acid
- 5 2,4-Dibutoxybenzoic acid
- 4-Butoxy-2-chlorobenzoic acid

- 4-Propoxymethylbenzoic acid
- 10 Sodium hydride (50% in oil; 0.42 g) was cautiously added to a solution of propanol (0.6 g) in DMF (8 ml). After gas evolution ceased, methyl 4-bromomethylbenzoate (1.0 g) was added. After 4 hours, the mixture was partitioned between water and ethyl acetate. The organic phase was dried over magnesium sulfate and concentrated. The residue was hydrolyzed by method P-a. This resulted in the product with the molecular weight of
- 15 194.23 (C₁₁H₁₄O₃); MS (ESI): 195 (M+H⁺).

The following compounds were prepared analogously:

- 4-Ethoxymethylbenzoic acid
- 4-Butoxymethylbenzoic acid
- 4-Isobutoxymethylbenzoic acid
- 20 4-Phenoxymethylbenzoic acid
- 4-(Pyridin-3-yloxymethyl)benzoic acid
- 4-(Pyridin-2-yloxymethyl)benzoic acid
- 4-Benzoimidazol-1-ylmethylbenzoic acid
- 4-Indol-1-ylmethylbenzoic acid
- 25 4-Phenylsulfanylmethylbenzoic acid
- 4-(Pyrimidin-2-ylsulfanylmethyl)benzoic acid
- 4-(Pyridin-2-ylsulfanylmethyl)benzoic acid
- 4-(2-Cyanophenoxymethyl)benzoic acid
- 4-(2-Chlorophenoxymethyl)benzoic acid
- 30 4-Cyclobutoxymethylbenzoic acid
- 4-Cyclopentyloxymethylbenzoic acid
- 4-Cyclohexyloxymethylbenzoic acid
- 4-sec-Butoxymethylbenzoic acid
- 4-Pentoxymethylbenzoic acid

35

4-(3-Oxo-3a,4,5,6-tetrahydro-3H-cyclopentapyrazol-2-yl)benzoic acid

A solution of 4-hydrazinobenzoic acid (0.3 g), ethyl-2-oxocyclopentanecarboxylate (0.31 g) and p-toluenesulfonic acid (340 mg)

in ethanol (12 ml) was boiled under reflux for 12 hours. The concentrated reaction solution was purified by preparative HPLC. The isolated reaction product (as ethyl ester) was hydrolyzed by method P-a. This resulted in the product with the molecular weight of 244.25 (C₁₃H₁₂N₂O₃); MS (ESI): 245 (M+H+).

4-Butoxy-2-methoxybenzoic acid

4-Hydroxy-2-methoxybenzaldehyde was alkylated with 1-bromobutane by method H. The resulting aldehyde (6.4 g) in dioxane (100 ml) was mixed with sodium dihydrogen phosphate (14.4 g) and sulfuric acid (2.4 ml), and the solution was cooled to 10°C. A solution of sodium chlorite (3.61 g) in water (100 ml) was added in such a way that the temperature did not exceed 10°C. 15 minutes after the addition was complete, sodium sulfite (4.6 g) was added. After a further 15 minutes, the pH was adjusted to 2 with hydrochloric acid and the dioxane was removed in a rotary evaporator. The aqueous phase was extracted with ethyl acetate. The organic phase was dried over magnesium sulfate, filtered and concentrated. The residue was purified by preparative HPLC. This resulted in the product with the molecular weight of 224.26 (C₁₂H₁₆O₄); MS (ESI): 225 (M+H+). 4-Butoxy-5-chloro-2-methoxybenzoic acid was obtained as by-product.

4-(1-Propoxyethyl)benzoic acid

Methyl 4-(1-hydroxyethyl)benzoate (2.0 g) dissolved in DMF (30 ml) was mixed with propyl iodide (3.8 g), and then sodium hydride (50% in oil, 0.53 g) was added. After the end of the exothermic reaction, the mixture was stirred for 1 hour and then water was cautiously added. It was extracted with ethyl acetate, and the organic phase was dried over sodium sulfate, filtered and concentrated. The residue was hydrolyzed by method P-a. This resulted in the product with the molecular weight of 208.26 (C₁₂H₁₆O₃); MS (ESI): 209 (M+H+).